NATUR CYMRU
Nature of Wales

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- Ffos-y-Fran land reclamation
- Feral goats
- The CAFE project
- Marine fishes
- Palod ar Ynys Dewi
- Landhoppers
- Plants under threat
- Seaweed harvest
- Books, News, Comment...

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NATUR CYMRU
The Nature of Wales

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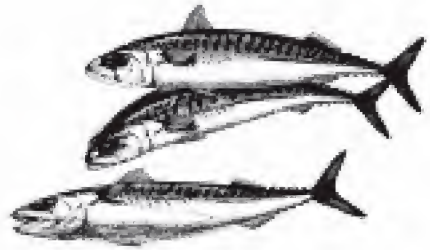
NATUR CYMRU GOLYGYDDOL



Un o'm tasgau fel golygydd yw chwilio am straeon difyr yn sôn am yr amgylchedd a gofyn yn daer i wahanol awduron eu hysgrifennu. Dydy'r holl ymbil yma ddim cynddrwg â hynny, ond dydy o ddim yn un o'r agweddau gorau ar y gwaith. Felly, braf iawn yw gallu dweud bod pethau, erbyn hyn, wedi newid, a bod mwy a mwy o bobl yn ysgrifennu o'u gwirfodd.

Un enghraifft yw hanes gwaith glo brig arbennig – neu gynllun adfer tir. Er gwaetha'r holl ddadlau ar y pryd, ni lynodd yr hanes yn fy nghof; ond cefais fodd i fyw wrth ddarllen erthygl ddifyr Nick Hunt sy'n sôn am ddwy weledigaeth wahanol ar gyfer y tir diffaith. Gallai'r adfywio a welir mewn gweithfeydd glo brig gael cryn effaith ar newid hinsawdd. Ond onid buddiannau tymor byr sy'n cael blaenoriaeth bob tro? Yn yr achos yma, datblygu ar y naill law, a dim llygredd na sŵn ar y llaw arall.

Ar ôl adfer a thacluso rhan arbennig o Ferthyr Tudful, faint o hanes y lle – gan gynnwys y drychineb erchyll – fydd ar ôl wrth i genedlaethau'r dyfodol droedio'r mynyddoedd llyfn, coediog, twt? Mae hyn yn gwneud imi sylweddoli pa mor lwcus ydyn ni o gael rhywle fel Cwm Idwal yn Eryri, lle bwriodd Darwin ei brentisiaeth fel daearegwr. Yno, gallwn gerdded yn ôl troed Darwin; ac, fel y gŵr ei hun, gallwn ddeall y stori sy'n llechu tu ôl i'r dirwedd rewlifol a welwn o'n blaen, gyda'i meini dyfod a'i marianau.

Mae Darwin yn cael ei grybwyll mewn dwy erthygl. Mae Peter Howlett a Tom Sharpe yn esbonio pa mor bwysig fu ei ymweliadau â Chymru; ac aiff Ivor Rees ati i sôn am ei waith gyda chregyn llong – sef pethau y daeth ar eu traws am y tro cyntaf, efallai, wrth fwynhau gwyliau yn Nhywyn.

Mae cyfrinachau organeddau'r môr yn dal i gael eu datgelu. Yn ei erthygl, mae Paul Kay yn esbonio'r cymhelliant tu ôl i fenter uchelgeisiol sydd wedi esgor ar gyfrol wych yn sôn am bysgod môr Cymru.
Mae'n haws adnabod pysgod yn y môr nag ar lechen y gwerthwr pysgod. Ac i gloi trafodaethau'r cylchgrawn ar y môr, sonnir am gynaeafu gwymon a'r holl bethau y gellir eu gwneud ag o.

Rhywogaethau wedi'u cyflwyno yw testun tair erthygl. Bellach, mae sboncyn y llawr – sef berdysyn o Awstralasia sy'n byw ar y tir – wedi cyrraedd ein glannau ac yn ehangu'i orwelion, heb unrhyw effaith anffafriol hyd yn hyn. Dyma wrthgyferbynnu'n llwyr â rhywogaeth arall sydd wedi'i chyflwyno, sef jac y neidiwr, gan fod y planhigyn yma'n bygwth planhigion pwysig eraill yn rhannau uchaf ardal Afon Gwy. Felly, mae angen inni dorchi ein llewys a thynnu hyd nes y bydd gwreiddiau'r planhigyn yma wedi gollwng eu gafael ar y tir.

Sôn am gyflwyno geifr lledwyllt i Eryri a wna Huw Jenkins yn ei erthygl hyfryd. Er ei fod yn pryderu am 'ei eifr', fe ŵyr o'r gorau y bydd yn rhaid rheoli'u niferoedd. Cadw cydbwysedd sy'n bwysig. Os ydym am sicrhau cydbwysedd yn yr amgylchedd yn gyffredinol, yna mae gennym lawer iawn o waith i'w wneud eto. Rydym yn troedio dibyn dwfn, ac os llithrwn ni, fe fydd y codwm yn un enfawr.

James Robertson

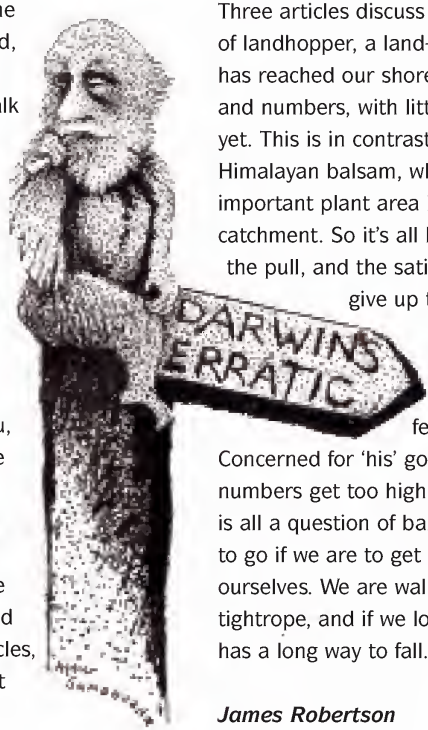
Goldenrod

NATUR CYMRU EDITORIAL

Part of an editor's job is to search out interesting environmental stories and browbeat potential authors into telling them. This is not as bad as it sounds, but it isn't the most glamorous aspect of the job. I am pleased, therefore, that there has been a shift over the years towards a greater number of articles volunteered rather than commissioned.

One example is the story of an open-cast mine, or rather a land reclamation scheme. This had rather passed me by, despite the controversy it raised when first proposed, but I was delighted to read Nick Hunt's compelling account of two different visions for a derelict landscape. The resurgence of open-cast mining has worrying implications for climate change. In the end, though, I was left wondering whether short-term interests aren't always going to dominate; in this case development on the one hand, freedom from noise and pollution on the other.

How much of its history, including the horrors of a disaster, will a reclaimed, sanitised Merthyr Tydfil landscape give up, when future generations walk over its smoothly contoured, purposefully treed hills? This thought makes me appreciate how fortunate we are that there are places like Cwm Idwal in Snowdonia, where Darwin cut his geological teeth. You can retrace Darwin's footsteps and, like him, understand the story behind the glacial landscape laid out before you, complete with perched glacier-borne erratics and moraine deposits.



Two articles feature Darwin. Peter Howlett and Tom Sharpe explain the importance of his visits to Wales; and Ivor Rees tells of his work on barnacles, which he may have encountered first while on holiday at Towyn.

Snake pipefish

The secrets of marine organisms are still being uncovered, and Paul Kay explains the motives behind a huge undertaking which has resulted in a splendid guide to the marine fishes of Wales. Fish are easier to identify in their element than on the fishmonger's slab. A review of the harvesting of seaweeds and their uses completes the marine element of our magazine.

Three articles discuss introduced species. One species of landhopper, a land-dwelling antipodean shrimp, has reached our shores and is expanding in range and numbers, with little apparent adverse effects as yet. This is in contrast to another introduction, Himalayan balsam, which poses a threat to an important plant area in the upper River Wye catchment. So it's all hands to the pump, or rather to the pull, and the satisfying squelch as balsam roots give up their tenuous grip on the land.

Huw Jenkins writes movingly about another introduction, feral goats in Snowdonia. Concerned for 'his' goats, he knows that when numbers get too high, they need to be controlled; it is all a question of balance. There is still a long way to go if we are to get the environmental balance right ourselves. We are walking an environmental tightrope, and if we lose our balance, *Homo sapiens* has a long way to fall.

James Robertson

My Feral Goats

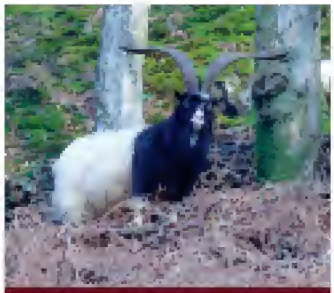
All pictures: Huw Jenkins

The unicorn goat

The 'wild' goats of Snowdonia raise strong emotions, defended by those who love to see these magnificent animals in a glorious mountain setting, but less popular with those who see the damage they do, to trees, rare plants and gardens. ***HUW JENKINS*** *reports on how a balance is being maintained between man and beast, while retaining an affectionate respect for 'his' goats*

When a man from the forestry said he was thinking of culling the goats my body tensed and logic was pushed aside by emotion. I like what he's doing to the forest behind me, replacing regiments of sterile conifer with a rich mix of broadleaf, but the trouble is, so do the goats. They love the tender shoots and bark of young saplings and it's not so difficult for them to break through the skimpy, protective tubes.

'My goats' are a small gang that live close to our house in the foothills of Moelwyn Bach overlooking the Vale of Ffestiniog. There were six when I first met them, led by an impressive billy crowned with unwieldy, lyre-shaped horns. At the end of that autumn's rutting season he had been ousted by a thug with a single, scimitar-shaped horn - if he deigned to look at you his face was twisted by the heavy side.


Spotting 'half sheep' from a distance

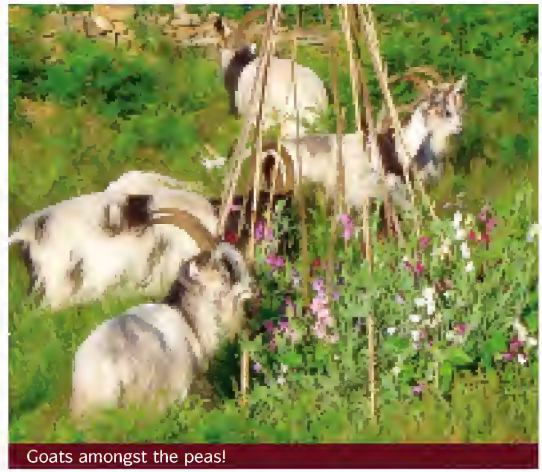
They come and go as they please within a couple of miles from where they were born. For over two centuries goats have grazed these mountains free-range, escapees from ancient farming stock, discarded with the advent of high volume sheep production. They were the perfect multi-purpose animal providing meat and skin, milk, tallow for candles and hair for judges' wigs. A mixed flock was considered a good combination with agile goats removing the temptation of lush plants on ledges too perilous for cumbersome sheep.

Goat rescue

I took a phone call from my neighbour the farmer – a goat was stuck on a stone wall, could I help him get it down? The goat's back leg was caught in strands of wire that topped the wall. Its head was on the ground, watching us through the unblinking upside eye, weak from the ordeal and with rusty metal cutting deep into its hoof. We lifted the goat, snipped the wire and carried her down the hill – she must have been trapped for a couple of days and had lost the use of both back legs. Medicine was prescribed and the farmer housed and fed her in a pen and each evening for several weeks the family of goats walked by and called out to her. Eventually she recovered, hopped out and rejoined the gang, maybe not as nimble as before and wearing a red tag on each ear - farmers do these things.

Weeks can go by without seeing my goats then one day they'll stroll past. Then, working as a team, they will rear up on hind legs to pull down oak branches, releasing them like a spring when their mouths are bulging with leaves. Sometimes I hear them coming, announced by the plaintive whinnies of a straggler trying to catch up, or I get a whiff when I'm downwind of them. They don't mind me being around but if I get too close the billy leads them off.

'Legless' recovered from her ordeal

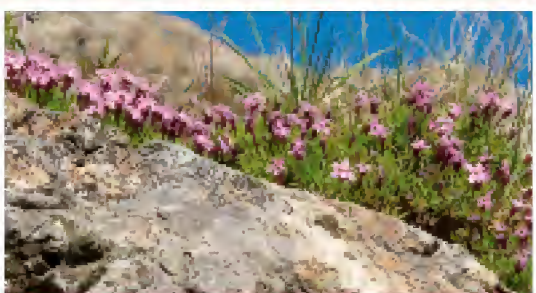

Goats amongst the peas!

Garden attack

They seemed to admire and note our efforts to cultivate the walled garden and I naïvely thought they'd respect our territory. To my dismay I returned one evening to find them munching the runner beans, uprooting strawberry plants and snapping newly planted fruit trees. My instinct was to shake a stick and curse as the adults hopped out and the young kid wriggled through a gap in my porous defences. But I'm not that scary and they were back again the following day so I set to and built a fence on top of the walls. Since then they have left my crops alone.

Sunbathing in Cwm Idwal

Each December I take part in the Snowdonia goat census, over several days counting as best we can in snow, cloud and rain. We look for 'half sheep'; from a distance the black parts of their coats make them look like truncated sheep. If we get close enough we study their horns to sex and age them. They are multiplying fast on the back of mild winters and making ever more impact on best endeavours to regenerate ancient woodlands.



Moss campion

Goats and the arctic alpines

Last year I joined in with the Glyderau part of the census and was assigned to a group led by Hywel Roberts, a senior warden and specialist in upland plants. Our route took us from Llyn Ogwen to the east of Cwm Idwal up a narrow ridge to the summit of Glyder Fawr where we huddled behind pillars of rock as the snow flew past and munched sandwiches. No goats were to be seen up here. The path, which is faint at the best of times, was barely visible and I was grateful for an expert guide as we descended towards the jumbled up rocks of the Devil's Kitchen. I was even more grateful for the impromptu introduction to the world of Snowdonia's rare arctic alpine plants and, whilst we couldn't see them, I made notes of where to look for them.

By the end of the day we had counted 27 goats in the Cwm Idwal area, looking as cold and wet as I felt, contributing to the total of 117 for the Glyderau, a modest increase of 12 over the previous year.

The following summer I returned with my rucksack weighed down by a hardback copy of *The Plant Life*

of Snowdonia. Moss campion, a sponge of green with masses of pink flowers, was offset beautifully by the blue skies above the cliffs to which it clung limpet-like. I found roseroot, globe flowers, northern marsh orchids, all sorts of saxifrages and many plants waiting to be matched up with descriptions in the book. But my real quest was the Snowdon lily and Hywel had told me that, ironically, Castell y Geifr (Goat Castle) was one of the few cliffs in Snowdonia where it could be found.

Moelwyn goat

I eventually found one on the shady side looking towards the sea. So prim and proper, it looked like a ballerina posing on one foot with her arm and face stretched upwards. Alas the petals were closed so she was not the ideal photograph. Looking upwards over the dark overhanging rock I could see a line of five or six plants running up a crack and the highest was temptingly but dangerously in full bloom. A small inconspicuous label bearing the number '10' had been glued to the rock – proof that I had not discovered a new colony.

I felt elated that I had found this wonderful plant; every Welsh person should have it on their 'bucket list' - things to be experienced before you kick the bucket. On my way down I came across a solitary goat enjoying the sunshine, a bit unicorn like and with a 'butter wouldn't melt in my mouth' sort of look. Many of those wonderful plants were within reach of a hungry goat... but maybe they don't taste as nice as they look?

My garden is small enough to defend but on a landscape scale fencing is not a viable option. Transportation and contraception are impractical and alas culling by a marksman is the only practical option. But surely not my goats?

Despite the mild winters my gang has had a run of bad luck and is down to just four adults. The one with red tags in her ears was found at the bottom of a cliff, maybe she never regained full agility, and the eldest female died in childbirth with the first of twin kids beside her. I think we're off the forestry man's radar for the moment, which is good news, and this year's kid looks fit and well and full of mischief. For the time being there is an acceptable balance of nature in this part of Snowdonia - thanks in part to my garden fence.

Huw Jenkins *is a freelance writer and records articles for Radio Wales's* Country Focus. *He is author of* Not Just a Pretty Place, *which is reviewed on p. 44.*

Cadw'r heddwch – am y tro

Gelynion neu gyfeillion? Tybed sut fyddech chi'n disgrifio geifr Eryri? Ar un adeg roedden nhw'n werthfawr fel ffynhonnell o gig a chrwyn, gwêr canhwyllau a blew i greu penwisgoedd barnwyr. Ond bellach maen nhw'n achosi tipyn o ben tost wrth grwydro'n rhydd ar hyd llethrau Eryri. Maen nhw'n sbwylio ymdrechion i ail-goedwigo drwy dynnu rhisgl a llowcio dail oddi ar y coed collddail ac maen nhw'n rhy hoff o lawer o flodau a llysiau gardd (er y gall ffens ddestlus fod yn ddigon i'w cadw draw, fel y profodd yr awdur). Cred rhai y gallent hefyd ddinistrio'r gerddi gwyllt o blanhigion arctig-alpaidd, sy'n tyfu'n uchel ar greigiau'r mynyddoedd. O gofio ehangder Eryri, nid oes gobaith rheoli'r geifr drwy ffensio, neu ddulliau atal cenhedlu. Saethu dewisiol yw'r unig opsiwn. Ond mae'r awdur hwn, o leiaf, yn falch bod cydbwysedd wedi ei daro, am y tro, rhwng cadw ei gymdogion blewog, hoffus a chynnal ei resi taclus o bys a ffa.

Chris Austin

A failure of vision

Residents protest against Ffos-y-Fran

Contentious environmental issues are seldom black and white. Whether human interests are seen as primarily about economic welfare or a healthy planet may be underpinned by very different values. Here ***NICK HUNT*** *investigates the real meaning of the Ffos-y-Fran Land Reclamation Scheme.*

Nick Hunt

I'm standing on the brink of a devastated landscape. The entire mountaintop as far as I can see has been torn open by heavy machinery, exposing dark layers of coal beneath, interspersed with streaks of dirty snow. Two hundred and fifty-tonne Komatsu excavators toil in the mud far below, scooping up the exposed coal and sending it crashing into the beds of 100-tonne payload trucks. The scale is almost too vast to take in. Regarding this bleak industrial scene, James Poyner, joint managing director of operating company Miller Argent, invites me to have a vision.

"In 17 years, all of this will be restored to a pre-Industrial Revolution landscape. There will be rolling hills with sheep grazing on them, trees, places for people to walk their dogs. It will be there for the benefit of future generations. It will be lovely."

It takes a lot of imagination to envisage the sight that lies before me transformed into the rural idyll that Mr Poyner describes. I'm in Merthyr Tydfil, South Wales, looking at one of the UK's largest opencast coal mines. Or, as my host insists: one of the UK's largest land reclamation schemes, which "incorporates the extraction of coal by opencast

methods." This may sound like splitting hairs, but the distinction is important.

The Ffos-y-Fran Land Reclamation Scheme opened for business, to a storm of protest, in 2007. Over the course of 17 years, 1000 acres of 'acutely derelict and dangerous' ex-industrial land will be restored to its former condition and returned, at no cost to the public purse, to common ownership. So far so good. But there's a catch. Before this restoration takes place, 10 million tonnes of coal will be extracted from the ground, much of it destined for the nearby Aberthaw power station. The actual land reclamation bit – replenishing the topsoil, planting the grass – will take a grand total of two years, plus a five-year period of aftercare. The coal mining bit, which Miller Argent claims is ancillary to the overall scheme, will take 15 and a half.

Mr Poyner is at pains to emphasise that restoring the land on such enormous scale could not possibly have been financed by the local council. "There were huge areas of dereliction. Without the recovery of coal, nobody could have afforded to do this." He points out that the scheme was not conceived by conniving coal industry bosses, but by the Local Authority and Welsh Assembly Government, who granted Miller Argent access to the coal only on the condition they performed the land restoration. While opponents have decried Ffos-y-Fran as the rebirth of opencast mining in Britain, Mr Poyner insists the project is merely the third and final stage of the larger East Merthyr Land Reclamation Scheme that dates back to the 1980s.

So what's the true nature of Ffos-y-Fran? Is it, as the authorities claim, a clever, cost-effective way to fund long-overdue land improvement? Or, as the objectors maintain, merely a cynical ploy providing cover for the exploitation of coal on a massive scale?

Unlike the snow-patched quarry before me, the story is not black and white.

There's no doubt that something had to be done to improve the land's condition. Merthyr Tydfil, once at

Nick Hunt

the vanguard of the Industrial Revolution, has served as a dumping ground for much of its waste for centuries. Formerly Wales' most populous town and the biggest iron producer in the world, its fortunes went into terminal decline when the ore ran out in the late 19th century; it is now one of Britain's most deprived areas, with the country's 13th lowest life expectancy and 54% of its population classed as 'economically inactive.'

Generations of heavy industry have taken their toll on the environment. The site that comprises Ffos-y-Fran is riddled with abandoned mineshafts, some dating back to the primitive bell pits dug in the 16th century, prone to unpredictable and potentially fatal collapse. There were three illegal landfill sites choked with industrial waste, one of which was even found to contain an unexploded World War II bomb.

The 1966 Aberfan disaster – when 144 people, including 116 children, died when a mountainside of mining slag collapsed onto houses and the village school – occurred just five miles from Merthyr Tydfil. Much of the debris from the clean-up operation was subsequently dumped at Ffos-y-Fran, a poignant symbol of the need to right the wrongs of past industrial development. Mr Poyner invokes the ghost of this tragedy to emphasise Miller Argent's role in cleaning up the land, protecting the local community.

"We've also gone to enormous efforts to safeguard the ecology," he adds, citing the preservation of an

Chris Austin

Too close for comfort?

ancient wooded valley and an iron age settlement, as well as the 'translocation' of protected lapwing breeding sites and endangered great crested newts. The company, apparently, has even installed an 8.5km 'newt fence' to stop the newts returning to the mine, which, Mr Poyner assures me, is patrolled daily.

These arguments certainly sound convincing. It seems Miller Argent has all the bases covered. But if the Land Reclamation Scheme brings such glowing benefits to the area, why does it continue to be the subject of so much controversy?

To find out, I visit Alyson Austin, one of the more prominent voices of local campaign group Residents Against Ffos-y-Fran (RAFF), which has been fighting the scheme since its inception.

"Everyone knows the land reclamation is just an excuse to get at the coal. People aren't stupid," she says. "It's true the land was full of mineshafts. This whole town's like a Swiss cheese. But we believe it could be reclaimed without spending 15 years digging coal out of it first."

Mrs Alyson, a middle-aged mother of two who's never been involved in activism before, doesn't exactly fit the stereotype of the 'usual suspects.' She became involved with the campaign after moving into a new house situated, as Mr Poyner delights in telling me, on land that had itself been reclaimed in 'Phase I' of the East Merthyr Land Reclamation Scheme. That house lies only 400m from Ffos-y-Fran's outer boundary.

"You can hear the machines from inside the house," she tells me over tea, "People come in for a few minutes and say 'that's not so bad.' But it becomes unbearable when you have to hear it all the time. If you are sitting quietly, you hear a constant drone. It stops at ten o'clock at night and starts again at seven in the morning. This is six days a week. It drives us mad. It's like Chinese water torture."

The house of RAFF chairman Terry Evans is even closer to the mine, lying just 37m from its perimeter fence. Under Welsh Assembly regulations, opencast mines must be situated at least 500m from residential areas. But of course Ffos-y-Fran is not an 'opencast mine.' It's a 'land reclamation scheme.' It now becomes clear why Miller Argent are so insistent in applying that term. The euphemism has allowed the company in effect to skirt the regulations designed to protect inhabitants from dust and noise pollution.

Much controversy surrounds the effects of opencast mines on the health of those who dwell in so-called 'opencast communities'. Campaigners claim that particles of coal dust – PM10s and PM2.5s – cause asthma and other respiratory problems, particularly

in children. Miller Argent denies this, citing the Pless-Mulloli 'Newcastle Study' *Living near opencast coal mining sites and children's respiratory health* in 2000, which failed to find a definite link between opencast mines and health problems.

"There's plenty of other evidence, but they choose to ignore it," says Mrs Austin. "The Newcastle Study can't be accurately applied here. It was carried out around opencast mines that were worked between two and five years, whereas Ffos-y-Fran has a 15-year lifespan. The particle monitors they used in that study only measured PM10s, not the finer particles. You can't gamble with children's health on the findings of a single study."

RAFF have been a thorn in Miller Argent's side since 2005, when they successfully got planning consent quashed in the High Court. The Welsh Assembly subsequently got that ruling overturned in the Court of Appeal, but RAFF delayed the mine's opening again by petitioning the House of Lords. That petition was ultimately unsuccessful, and in 2007 the diggers moved in. Now, having failed in a recent application to secure a Judicial Review, the objectors plan on taking their protest to the European Parliament. Miller Argent claims the combined legal actions have cost the company millions of pounds, and dismisses the objectors as a handful of implacable wreckers who refuse to see reason.

But RAFF's campaign has now spread far beyond Merthyr Tydfil. The ominous spectre of a revival of opencast mining in the UK has drawn the attention of environmental groups around the country. Despite Miller Argent's insistence that Ffos-y-Fran is merely the final stage of a local land reclamation project, it would be naïve not to see the scheme in a broader national – and even global – context.

The coal industry in the UK is currently enjoying a renaissance. The confederation of UK coal producers CoalPro talks breezily about "a new sense of optimism", brought about, to a large degree, by a seismic shift in government policy. New Labour was firmly opposed to opencast mining in 1997, but since then its position has changed radically. "A number of government statements supportive of indigenous coal production have changed the picture significantly," CoalPro noted in 2006. According to Minerals UK, the British Geological Survey's centre for sustainable mineral development, planning permission was approved for a total of 14 opencast sites in 2007, while not a single application was denied.

Coal, as the government knows well, is the dirtiest of all fossil fuels. The objectors point out that the mine is not only ruining their lives today, but will impact on the rest of the world through future carbon emissions. George Monbiot estimates the coal from Ffos-y-Fran "will produce 29.5 million tonnes of carbon dioxide: equivalent, according to the latest figures from the Intergovernmental Panel on Climate Change, to the sustainable emissions of 55 million people for one year". Now is the time, the campaigners argue, for the government to turn its back on coal, whether opencast mined or not, rather than promote the extraction – and incineration – of millions more tonnes of it.

Mr Poyner counters with energy realpolitik. Whether we like it or not, he says, coal will continue to play a large part in Britain's energy mix for the foreseeable future. Moreover, in terms of emissions, it's actually more environmentally sound to extract coal here in the UK, rather than ship it from distant parts of the world. "I'm as concerned about climate change as

Gweld ymhell yw gweld yn gall

Beth yn union yw cynllun Ffos-y-Fran? Ai ffordd gost-effeithiol o ariannu gwelliant i dirlun un o gymoedd mwyaf difreintiedig y de, neu gynllun clyfar i gloddio glo brig ar raddfa enfawr? Mae'n gynllun 17 mlynedd – ei bwrpas yw cynhyrchu 10 miliwn tunnell o lo ar gyfer pwerdy Aberddawan ond y nod hirdymor, yn ôl y datblygwyr, yw adfer y tirlun yn un gwledig, gwyrdd a fydd yn llesol i drigolion Merthyr Tudful. Ni all neb wadu bod angen adfer y safle, sy'n frith o siafftiau ac yn gartref i wastraff diwydiannol a malurion a gliriwyd o Aberfan wedi trychineb 1966. Ond cred gwrthwynebwyr y gallai'r gwelliannau ddigwydd heb yn gyntaf dreulio 15 mlynedd yn cloddio glo. Maent yn poeni'n fawr am effaith sŵn a llygredd llwch ar iechyd trigolion lleol, yn enwedig gan fod y label 'adfer tirlun' a roddwyd ar y cynllun wedi caniatáu i'r datblygwyr osgoi rhai o'r rheoliadau sy'n gysylltiedig â phyllau glo. Ac er ymdrechion y datblygwyr i warchod madfallod dŵr cribog a chornchwiglod ar y safle, nid yw hyn yn ddigon i liniaru pryder gwrthwynebwyr ynglŷn ag effaith y diwydiant glo ar ein planed gyfan. Ar waethaf ymrwymiadau honedig y Llywodraeth i daclo newid hinsawdd mae'r gefnogaeth i'r diwydiant glo ar gynnydd.

the next man," he says, "But you've got to be practical. If you stop burning coal, which school do you close tomorrow? Which hospital? Electricity is the lifeblood of economic growth."

"You've got to look at the wider picture," says Mrs Austin. "You've got to look outside Merthyr Tydfil and see what's going on in the rest of the world. All the carbon that's being mined here will end up in the atmosphere. What's the point of having a few hundred jobs, and a nice green mountain to look at, if the rest of the planet is under water?"

There are two separate visions at Ffos-y-Fran. Miller Argent claims its opponents lack, or pig-headedly refuse to see, their long-term vision for the land: cleared of landfills and abandoned mineshafts and restored to its pre-industrial beauty (although the recent revelation that American company Covanta are planning to build an incinerator here, on Miller Argent land, somewhat spoils that picture postcard image).

But the objectors, in drawing the links between extraction of coal on a local scale and catastrophic global climate change, actually have the longer-term vision. They have looked beyond local concerns and seen the true cost of opencast mining, recognising that, ultimately, it will blight us all. To engage with the threat of climate change we need leadership, intelligence and courage, but also the imagination to look beyond immediate realities. This, in the end, is the vision we need. Not the false comfort of corporate greenwash, or the euphemism of an opencast coal mine masquerading as environmental improvement.

***Nick Hunt** is a freelance journalist focussing on environmental issues. His articles have appeared in The Economist, Resurgence, Geographical and other publications.*

Nick Hunt

The extent of the land reclamation scheme

Scarce plants under threat

Himalayan balsam at Pen-ddol Rock

One very special plant community is in danger of being overwhelmed by a rapidly spreading introduction.* ELISABETH HARRIS *reports on a problem facing Pen-ddol Rocks in Powys, and what can be done to help.

Himalayan balsam flowers

All photos: Elisabeth Harris

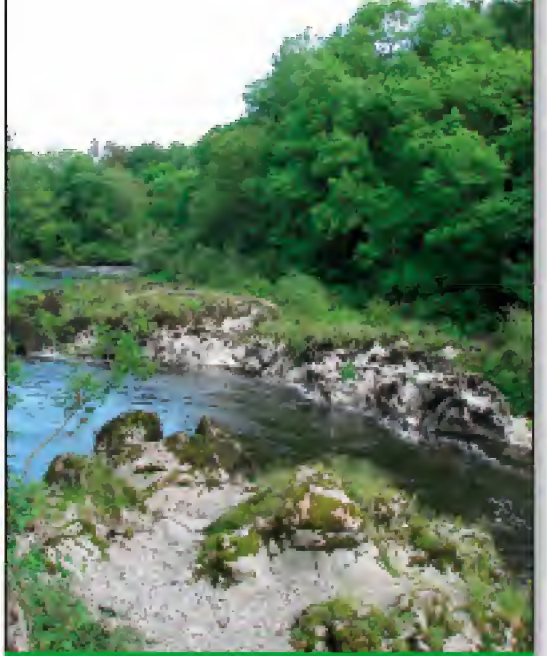
Pen-ddol Rocks are situated on the banks of the upper River Wye about one mile from the rural town of Builth Wells in Powys. They are part of the upper River Wye Site of Special Scientific Interest (SSSI) and are composed mainly of dolerite, a medium-grained igneous rock of the early-mid Ordovician (Upper Llanvirn-Llandeilo) period.

The rocks are visited regularly by local people, tourists to the town and walkers on the Wye Valley Walk, a route of some 136 miles from the Cambrian Mountains to the tidal estuary near Chepstow Castle.

The cracks, crevices and mosses of Pen-ddol Rocks support a sparse but floristically important plant community. The most common species are wild chives *Allium schoenoprasum*, the hawkweeds *Hieracium sabaudum* and *H. scabrisetum*, autumn hawkbit *Leontodon autumnalis*, goldenrod *Solidago virgaurea* and harebell *Campanula rotundifolia*, with smaller patches of bird's-foot trefoil *Lotus corniculatus*, common knapweed *Centaurea nigra*, wild thyme *Thymus polytrichus* and mouse-ear hawkweed *Pilosella officinarum*.

This plant community is particularly important due to the presence of wild chives, which has numerous purple or occasionally white florets in a rounded head and is a popular nectar source for insects such as bumblebees, hoverflies and butterflies. Wild chives are defined in the UK as Nationally Scarce. It is surprising, therefore, that although Wales has 44% of the total UK population[1] it is not listed as a priority species on the Wales Red List, Section 42 of the Natural Environment and Rural Communities Act (2006), or in the Local Biodiversity Action Plan for Powys.

A recent survey of Pen-ddol Rocks by Powys Flora Conservation has revealed a new threat to the wild



Pen-ddol rocks on the River Wye near Builth Wells

Birds foot trefoil

Birds foot trefoil *in situ*

chives plant community from Himalayan balsam *Impatiens glandulifera*.

Himalayan balsam was first introduced into Britain from the western Himalaya region of Asia in 1839. Since then it has become naturalised in the British flora and has spread rapidly along riverbanks and in nearby damp woodlands. The plant itself is the tallest annual in the British Isles, growing to a height of 2-3 metres[2]. Flowers are large and colourful, usually purple-pink or white. They are particularly attractive to bumblebees due to the copious amounts of nectar present in their short, bent spurs.

Himalayan balsam can produce up to 800 seeds per plant and seeds can remain viable in the seed bank for up to two years[2]. Seeds are buoyant and travel rapidly downstream to colonise new areas, especially in autumn floods. In the spring the entire seed population germinates to form a dense stand which shades out native plants, resulting in a reduction in biodiversity and a degradation of riparian habitat.

Currently the Environment Agency in Wales has no information on the spread of Himalayan balsam along the riverbanks of the upper River Wye.

A full list of taxa for the flowering plants recorded in the upper Wye SSSI can be downloaded online from the National Biodiversity Network (NBN) Gateway website (Riv-Rov section)[3]. NBN Gateway is a partnership involving many of the UK's leading conservation organisations such as the Countryside Council for Wales and Plantlife. Further contributions are made by local records centres and voluntary groups.

This website allows easy access to data and distribution maps from all over the UK and it covers the following species groups: simple organisms (protozoa);

Table 1: Threatened flowering plant taxa in the upper River Wye SSSI

Taxon	Wales Red Data List	GB Red Data List	GB Nationally
Campanula patula	CR	EN	NS
Daphne mezereum	CR	VU	NS
Galeopsis angustifolia	CR	CR	NS
Gnaphalium sylvaticum	CR	EN	
Mentha pulegium	CR	EN	NS
Potamogeton praelongus	CR	NT	
Potentilla rupestris	CR	EN	NR
Scandix pecten-veneris	CR	CR	
Valerianella rimosa	CR	EN	NS
Chamaemelum nobile	EN	VU	
Dactylorhiza viridis	EN	VU	
Papaver argemone	EN	VU	
Anagallis minima	VU	NT	
Anthemis cotula	VU	VU	
Clinopodium acinos	VU	VU	
Euphrasia anglica	VU*	EN	
Hypericum linariifolium	VU	NT	NR
Stachys arvensis	VU	NT	
Viola tricolor	VU	NT	
Bromus secalinus	NT	VU	NS
Dianthus deltoides	NT	NT	NS
Spergula arvensis	NT	VU	
Allium schoenoprasum	LC*	LC	NS
Cardamine impatiens	LC	NT	NS
Chrysanthemum segetum	LC	VU	
Cyperus longus	LC	NT	NS
Helleborus foetidus	LC	LC	NS
Misopates orontium	LC	VU	
Oenanthe fistulosa	LC	VU	
Orobanche rapum-genistae	LC	NT	NS
Platanthera bifolia	LC	VU	
Saxifraga hypnoides	LC	VU	
Scleranthus annuus	LC	EN	
Vicia orobus	LC	NT	NS

* >25% of the total GB population

Wild chives

fungi; invertebrates; amphibians; reptiles; fishes; birds; mammals; lower plants; and higher plants (conifers and ginkgo, fern and fern allies and flowering plants). Currently there are more than 4000 entries for higher plants on the database.

Close inspection of the upper R. Wye Excel datasheet reveals a number of species that are highlighted on the Wales and GB Red Data Lists. Both lists are based on the International Union for the Conservation of Nature (IUCN) Red List Categories and Criteria: Version 3.1[4].

All taxa listed as critically endangered (CR) are facing an extremely high risk of extinction in the wild; endangered (EN) taxa face a very high risk of extinction in the wild; and vulnerable (VU) taxa face a high risk of extinction in the wild. Near threatened (NT) taxa are close to qualifying for a threatened category in the near future, and least concern (LC) taxa are considered to be fairly widespread.

Nationally rare (NR, taxa that occur in 15 or fewer 10km squares in Great Britain) and nationally scarce taxa (NS, taxa that occur in 16-100 10km squares in Great Britain) are also listed (Table 1).

Autumn hawkbit

Goldenrod

The identification of so many threatened flowering plant taxa (including nine CR on the Wales Red Data List) in the upper River Wye SSSI makes the monitoring and protection of 'important plant areas' (IPAs) by conservation organisations an urgent requirement.

Short term aims

- Selection of IPAs using red list and national criteria
- Monitoring of IPAs and removal of *Impatiens glandulifera* on a year by year basis. Removal must take place in the spring before flowering and seed production

Long term aims

- The complete removal of *Impatiens glandulifera* plants from the upper River Wye catchment area, including nearby woodlands in the spring before flowering and seed production

Removal of Impatiens glandulifera

By hand

It is relatively easy to remove Himalayan balsam plants by hand pulling as the roots are shallow and are easily pulled up.

Using mechanical cutters

The use of mechanical cutters requires training and supervision of volunteers. Removal of plants is quick; however it is important to ensure that the stem is cut below the lowest node otherwise the plant can regrow, flower and set seed later on in the year.

Chemicals

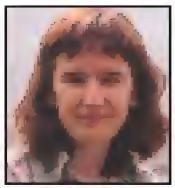
Various chemicals such as glyphosate-based weedkillers and the herbicide 2,4-D amine have been used to successfully remove Himalayan balsam from riverside banks. This is an expensive option requiring specialist training, the use of protective clothing and a duty of care if used close to watercourses.

Best option

The best option is the removal of Himalayan balsam by hand pulling; it requires little training and can be carried out by a large number of people. Furthermore it is friendly to the environment with no use of mechanical equipment or chemicals.

The removal of Himalayan balsam plants should be carried out by Welsh conservation organisations and the Environment Agency in Wales working in partnership with community groups, schools and individual volunteers. Such partnerships incorporate the Countryside Council for Wales' vision of 'Working together for a better Wales where everyone cares for and values the environment'.

Wales has a responsibility to monitor and protect all threatened taxa on the Wales and GB Red Data Lists, with urgent emphasis on those Welsh taxa that make up >25% of the GB population[1] and their habitats, or sadly future generations will not be able enjoy the beauty of our very special and diverse native flora communities.



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Powys Flora Conservation is currently undertaking a National Orchid Survey in Wales. The project also encourages the growth of wild flowers in gardens throughout the UK by giving away free plants and seeds to community volunteers.

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Himalayan balsam pods

Gormes ar yr Afon Gwy

Mae Creigiau Pen-Ddôl, ger Llanfair ym Muallt, yn cynnal casgliad hynod o blanhigion gwyllt. Yn eu plith mae'r genhinen syfi Allium schoenoprasum anghyffredin sy'n cael ei bygwth gan jac y neidiwr – y planhigyn estron o'r Himalaya a ddaeth i Brydain yn 1839. Dyma'r planhigyn unflwydd talaf ym Mhrydain ac mae'n lledu'n gyflym ar hyd ein hafonydd a thrwy goedwigoedd llaith cyfagos, gan dyfu'n gryf a thrwchus a rhwystro tyfiant planhigion eraill o'i amgylch. Mae'r hadau niferus yn cael eu cludo'n rhwydd ar wyneb y dŵr a gallant oroesi am 2 flynedd mewn pridd. Mae'r genhinen syfi yn un o sawl planhigyn prin a bregus yn rhannau uchaf yr afon Gwy. Mae angen adnabod yr ardaloedd pwysicaf ar gyfer y planhigion hyn, ac yna'u gwarchod. Yn benodol, golyga hyn bod rhaid clirio jac y neidiwr o'r ddalgylch afon gyfan yn rhannau uchaf yr afon Gwy.

Gellid ei dynnu â llaw, ei dorri'n fecanyddol yn isel ar y coesyn neu ei ladd â chwynladdwr (sy'n ddull effeithiol ond drud ac sy'n gofyn am gryn ofal, yn enwedig ger glannau afon). Mae cyfrifoldeb ar Gymru i ofalu am rywogaethau sydd dan fygythiad, ynghyd â'u cynefinoedd, ac yn enwedig y tacsa Cymreig hynny sy'n cynrychioli mwy na 25% o'r boblogaeth Brydeinig, fel y genhinen syfi.

All photos: Caroline Davies

Environmental education - *a sound investment?*

Penygloddfa School pupils pond dipping at Llwynderw Farm, Newtown

"Give me a child until he is seven and I will give you the man" – so runs the Jesuit motto. This age coincides with the end of the 'Foundation Phase' in Welsh schools, now recognised as the crucial early years when environmental awareness can influence a child's entire outlook on life. ***CAROLINE DAVIES*** *reports.*

Many people would agree that the future of our landscape and the continuing biodiversity of our indigenous flora and fauna will, in the medium term, depend on how it is understood and appreciated by current and future generations of just one species – *Homo sapiens*.

Many would also agree that, in Britain, we seem to have severed the old links between those who 'live on the land', depending for their livelihood on farming, and those who are detached from the land in our towns and cities. We often compare ourselves to France where familial connections between typically small farmers and their relations in the towns seem to have somehow endured. Certainly in many areas of England and Scotland large landowning enterprises occupy most of the land, but here in rural mid-Wales the family farm has survived. However, with the average age of farmers in Wales being 57 (EU Farm Structure Survey 2005), as farmers retire we should expect some marked changes to farming methods which will affect the environment of rural Wales over the coming decades.

Now I want to zoom in from the macro level to the micro and share with you some of the perspectives that I have discovered whilst working on the CAFE (Children, Agriculture, Food & Education) Project[1]. I want to

convince you that the voices I have listened to 'on the ground' are speaking good sense, and show that people can become passionate about issues that affect their daily lives when they have first hand experiences to give them confidence! It is my contention that, through education in the 'outdoor' classroom, we can lay the foundations for a public whose opinions are well informed and strongly held, and for whom the natural environment is of fundamental relevance and importance.

Seed of an idea

In 2004 a group of four farmers and three headteachers in Montgomeryshire came together with the aim of demonstrating the benefits of getting children out into the countryside, onto local family farms, to learn at first hand about food, farming and the environment. Their declared intent was to 'reconnect children to food & farming'. At its simplest the CAFE Project was a sort of dating agency for volunteer farmers who were willing, and indeed enthusiastic, about opening their farms up to schools, and for teachers who were keen to deliver the best learning environments to their pupils. The Project Officer was there to support communication between the two parties (fitting in with busy timetables and the challenge of the unexpected) and often made the difference as to whether the visit happened at all. Risk assessments (required by law from both parties) and the escalating cost of coach travel (eligible for a bursary which for many schools made the trip possible) were two practical aspects where help from the Project Officer was vital.

We started with the farms which were already in the Tir Gofal Agri-Environment Scheme offering Educational Access. However, there were only eight in the county and all were beef and sheep enterprises, bar one that had some field vegetables. None was a dairy farm. Recruiting farmers therefore became a key strand in the project, particularly farms local to schools where the possibility of repeat visits would enhance the learning experience. There was only one instance where the farm was close enough for children to walk avoiding main roads. Many of the farms recruited were involved with direct marketing

Watching the sheep at Nigel Elgar's organic farm

of their produce to the public. As a natural result of this the CAFE Project developed School Farmers' Markets which brought together consumers and producers in the local community, with the children playing a pivotal role in the whole enterprise.

Today's young children are surprisingly ignorant of what older generations take for granted as general knowledge. Teachers in Montgomeryshire told me that even in our most rural schools fewer than 15% of the children lived on a farm. Teachers have long been aware of their charges' declining 'general knowledge' about the world around them, in particular where their food comes from and how it is produced. Coupled with increasing concerns about a variety of issues such as health (physical fitness and diet), awareness of the wider world ('global citizenship') and the concept of sustainability, the CAFE Project was timely indeed.

A day on the farm

Usually the first school trip to a farm reveals how unfit many children are, as they walk quite a distance over rough and hilly land. Techniques for covering different terrains, that adults adapt to naturally, can leave some children stumped: the adults help them to navigate, providing reassurance as necessary. The repeat visits often empower the children to observe more and to form questions for the farmer springing from their own observations. In particular children usually have excellent visual memories and will

notice changes from the last visit in a way which never fails to impress the less observant adults!

The most frequent feedback from adults on these trips is that they had not realised the complex nature of the farmer's world: the infinite variation, day-to-day and season to season; dealing with the unexpected; problem solving with no option of delegation – the specialist knowledge and expertise required by today's farmers all make an impression. Yes, of course some children have simply not thought about where their food comes from before it reaches the shop, but this information is easily acquired. What regular visits to the real outdoors can instil is an understanding of the natural world and an appreciation of the issues where people are involved.

Arguably the most important lesson they learn is how our everyday decisions have consequences. Nowhere is this more clear than for the farmer, where cause and effect are clearly seen, but even for urban dwellers the implications of our choices regarding food, fuel use, transport and exercise have, cumulatively, profound effects on our environment. This concept is central to the curriculum under both Personal, Social and Health Education (PHSE) and Education for Sustainable Development & Global Citizenship (ESDGC). (It may seem to many of us parents that education – and farming – is all about acronyms these days but it pays to speak the language when trying to facilitate these activities!)

The Foundation Phase

Today a number of hitherto separate issues are converging, and being mutually reinforced as a result. Those who are passionate about biodiversity, woodland, education, rural communities, long term health, and sustainability in all its aspects are finding that one issue leads to another, and nowhere is this trend more evident than in education. In Wales the realisation that the basis for a child's experience of education is set in the first two or three years in school has led to the recognition of this as the 'Foundation Phase'. All schools are now aiming to teach at least 25% of the time in the 'outdoor classroom' during these crucial early years. In 2008 the Common Understanding Information Document for ESDGC was sent to every school in Wales requiring these aspects of learning to be implemented throughout the school and across the curriculum. The Healthy

History on the farm! Michael Jones tells Churchstoke School pupils about the Halifax Bomber that crashed on Dyffryn Farm

Schools Initiative tackles healthy eating and taking exercise. Eco-Schools initiatives help children to address issues such as litter, reducing waste, transport, healthy living, energy, water, school grounds and global citizenship.

Reaping the harvest

People may complain about the complexity of our modern world but it is a fact of life for younger generations. Global communications and increasing prosperity have opened up opportunities, possibilities and attendant consequences for which our 20th century education did not equip us. Today's young people are certainly up to acquiring the knowledge and experience that will enable them to make more informed choices in the 21st century. The work of the CAFE Project in Powys, and similar projects such as Learning on the Farm in Ceredigion and Carmarthenshire, has demonstrated that a small investment could enable this to happen for every child in every school. Drawing on the expertise of committed individuals in agencies, charities and associations to share their knowledge and inspire others should be a key feature of this provision.

As a footnote I want to tell you about a small aspect of one trip. A school visited a farm twice – first with the juniors then the infants. A junior lad, recently arrived at the school from a disturbed background,

Maesyrhandir School visit, Newtown

had been largely silent for a whole term, refusing to be drawn out. He had been on the junior trip and the teacher was inspired to take him along too with the infants. On this visit he became a helper, showing the smaller children things he had noticed and blossoming as a kind and observant leader in a non-threatening environment. The teachers marvelled at the capacity of the great outdoors to free the spirit, lend space for creativity, alter boundaries and engender sheer good fun!

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1. The CAFE Project was funded by a CCW Education Grant and in kind by Powys County Council 'Schools & Inclusion Service', with partners the Mid Wales Food & Land Trust.

Gweld y Byd o'r Buarth

Ai dosbarthiadau awyr agored yw'r ffordd i greu dinasyddion sy'n wybodus, yn barod eu barn ac sy'n gwerthfawrogi pwysigrwydd a pherthnasedd yr amgylchedd naturiol? Dyma beth y mae prosiect CAFÉ yn ei awgrymu. Nod gwreiddiol y cynllun, a sefydlwyd yn Sir Drefaldwyn yn 2004, oedd ailgysylltu plant ag amaethyddiaeth a chynhyrchu bwyd. Denwyd nifer o ffermwyr i wirfoddoli, er mwyn gallu dangos amrywiaeth o fentrau amaethyddol a chynnig lleoliadau cyfleus i'r ysgolion. Dysgwyd llawer o'r ymweliadau – am ddiffyg ffitrwydd corfforol plant a chymhlethdod bywyd ffermwyr, er enghraifft. Os mai dysgu am gynhyrchu bwyd oedd y prif amcan, gwelwyd bod ymweliadau rheolaidd â'r awyr agored yn cynnig llawer mwy na hyn - dealltwriaeth o'r byd naturiol a gwerthfawrogiad o'r pynciau y mae'n rhaid i bobl ymdrin â nhw. Y wers bwysicaf, efallai, oedd bod canlyniadau'n deillio o benderfyniadau dyddiol. A bod hynny'n wir nid yn unig yn achos ffermwyr ond hefyd ym mywydau trigolion trefol – lle mae penderfyniadau am fwyd, tanwydd, cludiant ac ymarfer yn effeithio'n fawr ar ein hamgylchedd. Mae cwricwlwm addysg Cymru bellach yn adlewyrchu'r plethiad hanfodol rhwng gwahanol ystyriaethau fel bioamrywiaeth, addysg, dyfodol cymunedau a chynaladwyedd. Ac mae prosiect fel CAFE yn dangos fel y gall buddsoddiad bychan helpu plant i gael yr wybodaeth a'r profiad i'w galluogi nhw i wneud dewisiadau mwy call ar gyfer byw yn y 21ain G.

All pictures: Paul Kay

The trouble with fish

Corkwing wrasse are to be found amongst the dense seaweed on Sarn Badrig

***Paul Kay**, author of a new Field Guide to the marine fishes of Wales, explains the importance of writing such a guide.*

Male dragonet, in breeding colouration.

The trouble with fish is that whilst we are all familiar with some of them, even if only on the fishmonger's slab, many remain hidden, deep below the waves, and are observed either outside their natural environment, or not at all.

One of the stock questions I ask when giving talks on fish is quite simply "How many species are to be found in, say, British and Irish waters?" The responses, even from those with an interest in fish, vary dramatically and suggestions have been as far apart as 50 and 10,000! The answer is in fact, as far as we are aware, around 500, but this does of course depend on how such a description is defined. In Welsh waters there are fewer: the deeper sea species found off the west of Ireland and northern Scotland are lacking here. We also lack records of both the warmer water species found off the south English coast and the

colder water species to the north. Just how many fish are found in Welsh waters is not precisely known but is likely to be in the region of 300-350.

Our understanding of what fish are found where comes from a variety of sources; commercial fishermen, anglers, scientists, rock-poolers, beach walkers and, a relatively recent addition to the list, scuba divers. But how many of these people are able to identify what they see? Unfortunately, this is not as easy as it might seem.

For a start, some fish are rarely seen (for example some of the gobies). When they are, they may be revealed in fleeting glimpses underwater when alive, or may be damaged if caught in netting. Since some similar species may only be easily differentiated by measuring fin ray lengths, this is far from helpful. In addition, many fish were originally described, by their original finders, from dead specimens, and these descriptions simply may not be all that useful when looking at a live fish.

Underwater photography

Recent advances in the ability to use high quality digital underwater cameras have meant that we are now able to photograph many fish underwater, and to take lots of photos of them. This makes it possible to gather far more data on many fish in their own natural environment, when they are not stressed. The digital files produced can actually yield as much information as looking at a specimen under a low power dissecting microscope and have the additional advantage of being accessible repeatedly via a readily available computer. By this means, we can advance our knowledge of marine fishes and their distributions.

To do this we need to enthuse people who regularly see fish so that they can accurately identify them and/or photograph them. This is the main purpose of *A Field Guide to the Marine Fishes of Wales*. Wherever possible we have illustrated the Guide using images of live fish. Other fish identification books do of course exist, but many use drawings, or other illustrations from which it is often difficult to identify live fish. Photographically illustrated marine identification books rarely seem to contain that many fish and when they do, these are generally the

A two-spotted clingfish off the north Llŷn coast

Now one of the commoner flatfish, this dab is off the north Llŷn coast

commonly seen ones (although inaccurate labels are not unknown with obvious confusion about identifications).

So it was high time for something more comprehensive and up to date. Frances Dipper and I wrote and illustrated the new *Guide* for the Marine Conservation Society with help from the Countryside Council for Wales. For the factually minded it includes descriptions, photographs or drawings of some 207 species, some of which have either not been seen in Welsh waters for a long time or, whilst within their range, have not as yet been recorded here.

Even now in the 21st century we were unable to track down some photos of live fish known to be found in

Red gurnards off the north Llŷn coast - one of the most spectacularly vividly coloured Welsh fish

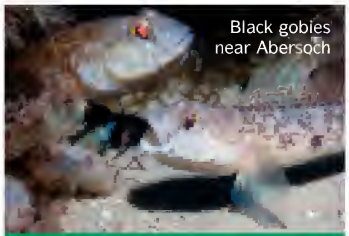
Welsh waters. Some live at greater depths than many scuba divers will normally venture, or on seabeds where few will go (not many divers wish to spend their precious few minutes underwater on deep mud for example). But more images are appearing, often originally misidentified, and it is to be hoped that before long many of the gaps can be filled. The book needs to be seen as 'work in progress'. It is intended to stimulate the identification of fish and the gathering of information and images.

Look out for wolf-fish and blenny

Of the fish which are rarely seen in Welsh waters, at least one now has a recent record – a Pembrokeshire angling skipper has confirmed that a wolf-fish was caught to the west of Skomer within the last few years, the previous records being mostly Victorian!

It is possible that another, the red or Portuguese blenny, may be in Welsh waters as it was (probably) unknown from Britain and Ireland until a few years ago, having been confused with the far more common tompot blenny. It is hoped that its inclusion in the book may result in someone finally realising that they have seen it rather than the tompot.

Despite all the research that went into the book, some fish remain stubbornly difficult to identify, or at least differentiate. There are three species of dragonet found within Welsh waters: while it is easy enough to both differentiate and identify male fish in their breeding colours, females and juveniles remain



Black gobies near Abersoch

Darganfod mwy am bysgod Cymru

Faint o bysgod sydd ym moroedd Cymru? Rhyw 300-350 yw'r ateb. Llai na'r cyfanswm ar gyfer Prydain ac Iwerddon gyfan; nid oes gennym y pysgod dŵr dwfn sy'n byw oddi ar arfordir Iwerddon a'r Alban, na chwaith y pysgod dŵr cynnes a welir ar hyd arfordir de Lloegr. Daw'r cofnodion o sawl ffynhonnell – ond tybed faint o bobl sy'n gallu adnabod rhywogaethau'n gywir?

Prif bwrpas *A Field Guide to the Marine Fishes of Wales* yw ysgogi pobl i adnabod a thynnu lluniau o bysgod ac i rannu gwybodaeth er mwyn cynyddu'n dealltwriaeth o bysgod Cymru a'u dosbarthiad.Mae technegau ffotograffeg tanddwr yn caniatáu i ni gasglu data a delweddau ar gyfer llu o bysgod byw yn eu cynefin. Tua 207 o rywogaethau a ddisgrifir yn y gyfrol. Ychydig a wyddwn am bysgod nad ydynt yn rhai masnachol. Mae rhai o bysgod Cymru yn byw mor ddwfn fel na fydd plymwyr yn mentro i'w cynefin ac mae eraill yn byw mewn cynefinoedd sy'n llai atyniadol i blymwyr – fel mwd!. Ond mae gwybodaeth a lluniau ychwanegol eisoes yn dod i law ac felly gwaith ar y gweill yw'r gyfrol hon, nid gwaith gorffenedig.

Snake pipefishes have increased in numbers over the last few years and are probably now the most abundant of the pipefishes

very difficult indeed. This is not helped by some of the more technical existing fish books offering different descriptions of them.

So while we have a great deal of knowledge about some fishes, especially those commercially landed and commonly angled for, we are sadly lacking much information about many others. Details of the natural history of some species are so sketchy as to be non-existent, and little behavioural information is known even about some of the commoner species.

We hope the new *Field Guide* will generate more information so that our seas and their inhabitants are a little better understood. Both of its authors look forward to the time when it is out of date!

Paul Kay *studied scientific photography before working as a volunteer at the Sherkin Island Marine Station where his interest in the marine environment began. He specialises in underwater photography with an emphasis on fish and stresses that he is a marine naturalist rather than anything else. Small fish especially fascinate him as he believes that they are poorly appreciated, rarely photographed and often misidentified, and one of his aims is to try to show that they can be identified and studied through the use of photography rather than the traditional method which all too often involves killing them!*

A Field Guide to the Marine Fishes of Wales *is reviewed on p. 46.*

All pictures: Isabella Brey

Landhoppers around Wales

Landhopper *Arcitlitrus dorrieni* female carrying eggs

There is an alien spreading through the leaf litter, and it could be lurking right outside your front door. ISABELLA BREY makes the introductions.

Juvenile landhopper

'Landhoppers' is a term unfamiliar to most people in the Northern Hemisphere. It refers to small crustaceans, more specifically to the fully terrestrial amphipods of the family Talitridae (Phylum Crustacea, Class Malacostraca, Order Amphipoda, Suborder Gammaridea), relatives of the more familiar sandhoppers of sandy beaches. To date, over 120 species of landhoppers are known, but while they are widespread in the Southern Hemisphere, landhoppers were completely absent from Europe and North America until the late 19th century.

As long-distance transport facilities improved and people became interested in growing 'exotic' Southern Hemisphere ornamental plants in their parks and gardens, landhoppers started to spread outside their native ranges. They travelled as stowaways among roots, particularly of tree ferns (*Dicksonia spp*.), which, as a result of their slow growth, were frequently transported as mature plants. In addition, their trunks (which themselves offer many hiding spaces) were often wrapped in leaf litter for protection, and *Dicksonia* leaf litter is known to harbour large numbers of landhoppers. Today, there are naturalised populations of a

Arcitalitrus dorrieni - note curvature of antennae as they are pushed forward

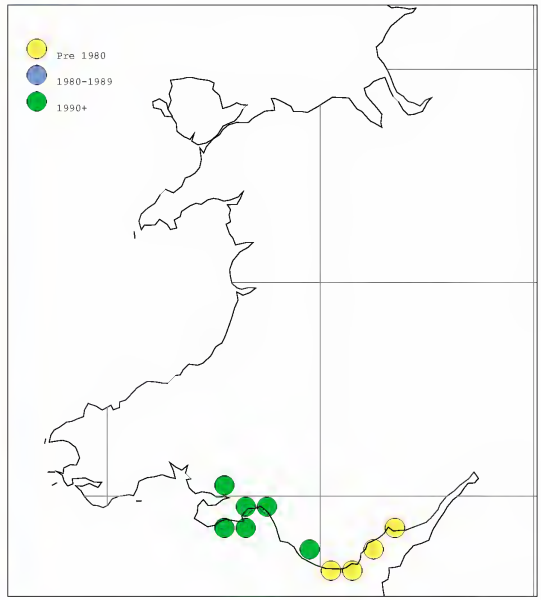
number of different landhopper species in Europe and the USA.

In Britain only one species, *Arcitalitrus dorrieni*, a native of New South Wales and southern Queensland has managed to establish itself outside the shelter of greenhouses. It was first recorded in the United Kingdom on the Isles of Scilly in 1924. Since then, populations of *A. dorrieni* have been reported from most of south-west England and a number of locations in south-west Wales (Figure 1). *A. dorrieni* has been spreading with increasing velocity in recent years. In the Swansea area, where I recently completed a five-year study of *A. dorrieni*, there have been marked expansions of the population during this period. Even in my own garden the situation went from 'no hoppers encountered despite avid gardening' in 2001 to 'numerous hoppers under every plant pot and anything else left out overnight' in 2008. Such rapid expansion coupled with impressive population densities means that it is not unlikely that the little alien will be making an appearance on your doorstep (or more likely under your doormat) before long.

Looks aren't everything

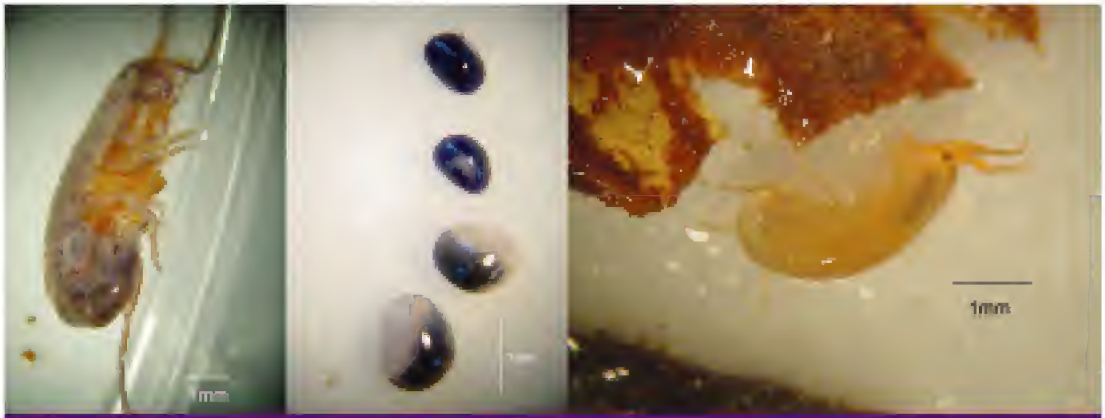
So how can you tell if that little unfamiliar-looking

Figure 1



creature you just encountered in your garden is, in fact, a landhopper? Landhoppers look similar to sandhoppers: they have a laterally flattened body with seven pairs of legs, and are dark brown in colour. They are generally smaller than sandhoppers, the largest females reaching a maximum of 15mm from the base of the antennae to the tip of the abdomen. In life they appear even smaller than this, as the abdomen is carried tucked under the thorax, ready to be rapidly uncurled to allow the animal to 'jump'.

Like their fellow terrestrial crustaceans, the woodlice, and in common with all other landhoppers, *A. dorrieni* possesses gills which are located in a ventral groove formed by deep side plates. In addition to housing the gills, the eggs and newly hatched young are carried in this groove by the female. In the UK *A. dorrieni* breeds from April to December, with most juveniles being released during the summer months. The ventral groove has to hold a water film at all times in order for the animal to survive and any eggs or young to develop. Since landhoppers possess no physiological adaptations against evaporative water loss through their body surface, their ability to withstand the desiccation pressures on land is effected solely by behavioural mechanisms. This means they are restricted to consistently humid habitats or microhabitats.



Female carrying young | Eggs, developmental stages | Juvenile having its first meal - note food starting to fill the gut

The result is that, in the UK, *A. dorrieni* leads a predominantly cryptozoic or hidden lifestyle in leaf litter and under logs or stones as well as other large objects, particularly planters and plastic sheeting.

Escape artists

When disturbed in one of these hiding places, *A. dorrieni* can be seen performing its characteristic escape response which gives rise to the landhopper's common name. A series of vigorous jumps is followed by the animal suddenly feigning death or disappearing into the substrate, if the texture allows. The landhopper leaps by rapidly uncurling its abdomen, resulting in jumps which can exceed 25cm in length and 10cm in height. The direction of jumps is erratic, which results in confusion of all but the fastest and most agile predators (and researchers!).

Once established in an area, landhoppers generally occur at high densities, with averages of around 300 per m^2 recorded in mixed deciduous coastal woodland in Swansea and reaching 800 per m^2 in particularly favourable locations within this woodland, a location with a uniform cover of thick, slowly decaying leaf litter. The disorienting effect of such large numbers of landhoppers performing their evasive manoeuvres makes for an effective defence mechanism against larger predators from outside the leaf litter. They are not that safe, however, where smaller predators hunting within the leaf litter are concerned. In contrast to many other leaf litter herbivores such as woodlice, they do not possess armour plating or distateful toxic defences. Under laboratory conditions, a number of native invertebrate predators avidly consume landhoppers, and undoubtedly such predation also takes place outside the laboratory.

Diet for success

In the face of such difficulties, how does *A. dorrieni* manage to maintain its high densities and even expand its range? The answer may lie in their diet. Many amphipods specialise in eating low-quality food such as algal fronds and other dead plant material. Their ability to thrive on such unattractive but vastly abundant material is one of the reasons for the great success of many aquatic amphipods, and *A. dorrieni*, too, feeds on a variety of dead plant material, although it does show some preferences. In our laboratory experiments, tough leathery leaves of evergreen broad-leaved species and leaves of grasses and bamboos were largely rejected, whereas leaves of common deciduous trees and many perennials were eaten avidly. Green leaves and even tender seedlings were always rejected, even after periods of food deprivation. Thus *A. dorrieni* is unlikely to constitute a garden or crop pest, even at the high densities it has been known to attain.

The high densities at which landhoppers occur once established lead to the question of what effect they have on the native ecosystem. In the Southern Hemisphere, landhoppers play an important part in leaf litter breakdown, ingesting up to 25% of the annual litter fall (depending on species) and

Native predators feeding on *A. dorrieni* under laboratory conditions, clockwise from top left: the spider *Haplodrassus sp.*, the beetle *Pterostichus sp.*, the centipede *Lithobius sp.* and the spider *Tegenaria sp.*,

markedly increasing the soil respiration rate where they are present. Calculations for two established populations of *A. dorrieni* in Britain and Ireland, one in Swansea and one in Co. Galway, Ireland (O'Hanlon and Bolger, 1997) also returned figures of around 25%. These figures suggest that the invader may be playing a more important role in breaking down the annual litter fall than any single native invertebrate group, consuming as much of the leaf litter as all other native invertebrates combined.

Relationship issues

So if they occur at very high densities and eat a large proportion of the leaf litter, does the presence of the landhopper have a detrimental influence on the native invertebrates that inhabit the leaf litter? It is not yet possible to know this with absolute certainty, as, apart from the recent study in Swansea, there has only been one other project investigating this aspect of landhopper biology (Bolger & Golden, 2000). Neither of these studies has shown statistically significant differences in the numbers of native invertebrates where the landhopper was present compared to similar habitat where it was absent. The results of the Swansea study, however, show some noticeable, albeit not statistically significant, differences in numbers of some invertebrate groups. Among these are decreases in the number of snails, earthworms and potworms in the presence of *A. dorrieni*, while numbers of woodlice and springtails were increased. Investigations of possible reasons for these changes indicate that it is most likely to be increased litter disturbance, not competition for food, that leads to

the observed decreases in numbers of snails, earthworms and potworms. The same activity, however, could be responsible for the increase in the numbers of springtails by creating new microhabitats. Woodlice, which rely on coprophagy (eating poo) for their long-term survival, may benefit from the landhopper's droppings, as well as the fact that predation pressure on them may be lessened if woodlouse predators also take amphipods as part of their diets. While woodlouse numbers were up in the presence of landhoppers in deciduous woodland, observations in gardens indicate that in the latter setting, woodlice decrease in number. It is possible that in gardens, where compared to woodlands food supplies are limited, woodlice are outcompeted by landhoppers.

A promising future?

A lot more research is needed before the true impact of the introduction of *A. dorrieni* in Britain can be fully understood. Compared to many other recent alien invaders, the landhopper is relatively innocuous, not causing problems for gardeners or predating any native species. As far as current investigations go, it has not disturbed the native communities where it has become established to an extent that endangers any native species. It undoubtedly does contribute to leaf litter breakdown, and it represents a new and locally abundant food source for native predators.

There have been many predictions about the future spread of *A. dorrieni* in Britain, and theories as to why it has not been spreading faster. Cowling et al (2004) have shown that both the sodium concentration of the substrate and deeply permeating frosts have a detrimental effect on landhopper populations. They conclude that major parts of the UK are unlikely ever to be successfully colonised. At the same time they consider it likely that large parts, particularly coastal regions in the South and West still remain to be invaded. This, along with indications that the landhopper is becoming increasingly resistant to low temperatures, make it likely that many parts of Wales will soon be able to welcome a new addition to their leaf litter fauna, and there is no doubt that this bouncy little alien is here to stay.

Isabella Brey *is a Zoologist based in Swansea.*

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Croesawu Estroniaid o'r De

Wrth i ddulliau cludiant wella, ac wrth i arddwyr droi'n gynyddol at blanhigion estron yn y 19egG llwyddodd chwain y tir Iedaenu tu hwnt i hemisffer y de. Cafwyd y cofnod Prydeinig cyntaf yn 1924 ond un rhywogaeth yn unig, sef Arcitalitrus dorrieni (o Awstralia'n wreiddiol), sydd wedi llwyddo byw tu allan i glydwch tai gwydr. Mae ar gynnydd ond mae'n greadur di-drafferth o'i gymharu â mewnfudwyr estron eraill. Fel chwain y traeth rhaid iddo fyw mewn cynefinoedd llaith am na all oddef sychder. Nid oes ganddo gramen galed na gwenwyn atgas i'w warchod rhag ysglyfaethwyr. Ceisia ddianc drwy neidio'n egniol i bob cyfeiriad ac wedyn ymddwyn yn farw, neu ddiflannu i'r swbstrad. Gall cannoedd ohonynt fod yn bresennol mewn cynefin addas, fel deilbridd coedwig. Gan eu bod yn bwyta planhigion gwyw nid oes angen i arddwyr eu hofni. Ond mae effaith Arcitalitrus ar yr ecosystem naturiol yn aneglur. Yn sicr gall helpu i bydru planhigion, ac mae'n ffynhonnell newydd a helaeth o fwyd i greaduriaid brodorol eraill. Nid yw, hyd yma, i'w weld yn tarfu ar y cydbwysedd rhwng rhywogaethau brodorol. Mae'n annhebygol o sefydlu ym mhob rhan o Brydain, ond gallai ledu ymhellach ar hyd arfordiroedd y De a'r Gorllewin. A chan ei fod yn llwyddo'n gynyddol i wrthsefyll oerfel mae'n siwr y bydd sawl rhan o Gymru yn croesawu'r creadur bach sbonciog hwn dros y blynyddoedd nesaf. Cadwch lygad ar agor amdano.

Eddie Tycer

Hudo adar y glannau

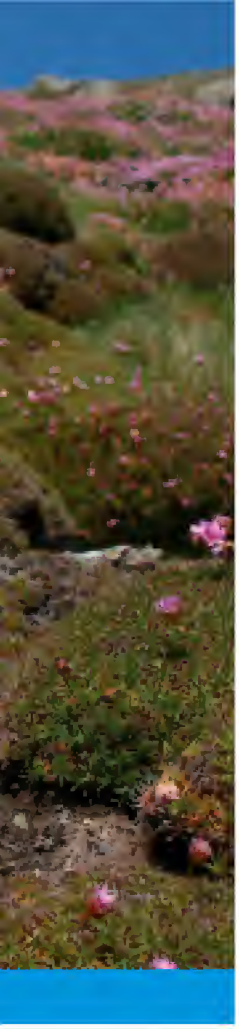
Modelau pâl a wnaed gan Eddie Tycer o blastig 3mm, gyda llenwad o bolywrethan a choesau alwminiwm / Eddie Tycer's puffin models made of 3mm plastic with polyurethane filling and aluminium legs

Mae modelau ffug o adar wedi cael eu defnyddio ar ddwy ynys yng Nghymru er mwyn denu palod nôl i nythu ar eu hen safleoedd. Ynys Aberteifi oedd lleoliad yr arbrawf cyntaf, ac Ynys Dewi yw'r safle diweddaraf i roi cynnig arni. Mae'r gwaith yn rhan o ymdrechion byd eang i warchod poblogaethau adar drwy ddefnyddio cyfuniad o dechnegau gwahanol. ***ELINOR GWYNN*** *sy'n bwrw golwg ar elfen Gymreig y gwaith hwn.*

Ydych chi'n un o'r rhai sy'n dotio at yr adar pren cerfiedig a ddefnyddid gan helwyr i ddenu hwyaid at ddŵr, ac sydd bellach yn hynod o gasgladwy? Mae'r modelau trawiadol hyn wedi bod yn boblogaidd iawn ers dechrau'r ganrif ddiwethaf, ac yn enwedig ers y 1970au. Mae pobl yn talu trwy eu trwynau amdanynt; y pris uchaf a dalwyd, hyd yn hyn, yw $856,000 a hynny am fodel o hwyaden frongoch (yn dyddio o 1875) gan Lothrop Holmes, mewn arwerthiant yn Efrog Newydd yn Ionawr 2007 (Ilun, isod).

Photo courtesy of Guyette & Schmidt, Inc.

Y gair Saesneg ar y modelau hyn yw 'decoy'. Tarddiad y gair yw'r enw Isalmaeneg am gawell hwyaid, sef 'eende(n)koai'. Hawdd yw deall, felly, sut y mae'r gair 'decoy' yn cyfeirio nid yn unig at y modelau adar ffug ond hefyd at bwll hela traddodiadol gyda thwnel gwiail ar ffurf côn ar un pen iddo; i hwn y byddai hwyaid yn cael eu gyrru wedi iddynt setlo ar y dŵr, nes iddynt gyrraedd cawell yn y pen draw. Caiff y math yma o ddyfais ei defnyddio hyd heddiw gan rai modrwywyr adar ond mae cadwraethwyr hefyd wedi dod o hyd i ddefnydd arall



i'r modelau cain sy'n dwyn yr un enw Saesneg â'r gawell hela.

Ond os mai denu hwyaid gwyllt at eu marwolaeth oedd bwriad gwreiddiol y modelau adar ffug maen nhw bellach yn cael eu defnyddio i geisio annog adar gwyllt i nythu o'r newydd. Yma yng Nghymru gwelwyd dwy ymgais o'r fath yn ystod y chwarter canrif diwethaf.

Yn wir mae'r defnydd o fodelau adar yn un o nifer o dechnegau sy'n cael eu defnyddio ar draws y byd bellach i ddenu adar sy'n nythu ar y ddaear, neu o dan yr wyneb, i setlo mewn safleoedd newydd neu i ail-gytrefu safleoedd nythu hanesyddol[1]. A gall hynny fod am sawl rheswm: diogelu gwytnwch rhywogaeth sydd dan fygythiad mewn un neu ragor o safleoedd eraill; cryfhau poblogaeth wan ar safle neu hyd yn oed ddiogelu casgliad o adar drwy eu symud yn gyfan gwbl i leoliad mwy diogel.

Yn y bôn, mae'r technegau a ddefnyddir i annog adar i nythu o'r newydd yn syrthio i ddau gategori gwahanol:

- technegau i greu neu wella cyflwr cynefin
- technegau sy'n gysylltiedig ag agweddau ar ymddygiad cymdeithasol rhywogaethau adar, ac sy'n cynnwys y defnydd o atynwyr gweledol (fel modelau denu a drychau), atynwyr acwstig (peiriannau sy'n chwarae sŵn galwadau adar) a thrawsleoli cywion ar adegau gwahanol yn ystod eu prifiant.

Fel rheol mae angen defnyddio cymysgedd o dechnegau er mwyn denu adar i nythu o'r newydd a rhaid meddwl yn ofalus am briodweddau ac ymddygiad gwahanol rywogaethau cyn penderfynu ar ddulliau penodol.

Criw Concrit Ceredigion

Ers y 1980au mae modelau wedi cael eu defnyddio ddwywaith i geisio denu palod nôl i nythu ar rai o ynysoedd de-orllewin Cymru. Ar Ynys Aberteifi y gwelwyd yr ymgais gyntaf. Roedd poblogaeth fechan o balod – dim mwy na 50 pâr yn ôl Bertram Lloyd yn 1924 - wedi bod yn nythu yma nôl yn y 1800au, ond cafodd y boblogaeth ei difa'n llwyr wedi i lygod ffrengig ddod i'r tir ar ôl llongddrylliad '*The Herefordshire*' ar yr ynys yn 1834[2].

Gwaith y 'National Audabon Society' yn UDA sydd wedi bod yn sail i lawer o'r technegau sy'n cael eu defnyddio ledled y byd i geisio sefydlu poblogaethau palod. Sefydlwyd 'Project Puffin' gan y gymdeithas honno yn 1973 er mwyn ceisio adfer y rhywogaeth ar Eastern Egg Rock yng nghulfor Maine. Roedd y palod wedi diflannu o'r safle hwn oherwydd iddynt gael eu gor-hela ar gyfer eu cig a'u plu ar ddiwedd y 19^{fed}G. Cludwyd cywion 17 diwrnod oed o Great Island Newfoundland i dyllau artiffisial ar Eastern Egg Rock a'u cadw'n gaeth yno hyd nes iddynt arfer â'u cynefin newydd, a'u bwydo ddwywaith y dydd wedyn nes eu bod yn barod i hedfan. Yn 1977 gosodwyd adar ffug (a wnaed o bren) er mwyn ceisio denu adar ifanc wrth iddynt ddychwelyd ac aethpwyd ati hefyd i ladd gwylanod yr ynys. Erbyn 1986 roedd 1000 o gywion wedi cael eu trawsleoli. Yn 1992, adar a drawsleolwyd oedd yn cyfrif am 72% o'r adar a oedd yn nythu ar Easter Egg Rock a Seal Island (gwarchodfa arall lle cafodd nifer debyg o gywion pâl eu trawsleoli yng nghanol y 1980au). Erbyn 2002 roedd yr adar a drawsleolwyd ond yn cyfrif am < 10% o'r holl adar a nythai yn y naill lecyn a'r llall - a hynny oherwydd bod cymaint o adar wedi cael eu denu yno o fannau eraill yng nghulfor Maine.

Liz Fleming-Williams

Ynys Aberteifi / Cardigan Island

Roedd y gwaith hwn yn UDA yn digwydd yn ystod yr un cyfnod ag arbrawf Ynys Aberteifi ac mae'n bur debyg iddo ddylanwadu ar weledigaeth Ymddiriedolaeth Bywyd Gwyllt Gorllewin Cymru (fel ag yr oedd bryd hynny), a oedd yn berchen ar yr ynys. Yn ogystal â cheisio denu palod i'r ynys fechan hon (y ddegfed o ran maint o blith holl ynysoedd Cymru) aeth yr Ymddiriedolaeth ati ar yr un pryd i geisio annog adar drycin Manaw i sefydlu poblogaeth ar yr ynys. O blith y gwahanol dechnegau denu adar sy'n dibynnu ar ymddygiad yr adar, mae dyfeisiadau gweledol (fel modelau) yn bwysig ar gyfer y rhywogaethau hynny sy'n brysur o gwmpas y nythfan yn ystod y dydd, fel y pâl. Er mwyn ceisio argyhoeddi unrhyw bâl a ddigwyddai fod yn hedfan heibio fod Ynys Aberteifi yn dipyn o '*des-res*' a bod yno boblogaeth o balod yn barod aed ati i greu modelau concrit o'r adar. Peintiwyd y rhain gan blant ysgol lleol, cyn eu gosod mewn mannau amlwg o gylch ymyl yr ynys (Llun 2). Gosodwyd drychau y tu ôl i rai ohonynt hefyd er mwyn creu'r argraff fod yno boblogaeth sylweddol. Ond methiant, gwaetha'r modd, fu'r ymdrech.

A 'doedd y canlyniad yn achos yr adar drycin Manaw yn fawr gwell. Trawsleolwyd 230 o gywion o Sgomer i Ynys Aberteifi rhwng 1980 a 1984. Cymerwyd hwy o'u nythod yn fuan ar ôl i'w rhieni eu gadael a gosodwyd nhw mewn tyllau artiffisial ar Ynys Aberteifi. Erbyn 1988 roedd tystiolaeth bod rhywfaint o weithgaredd o hyd mewn dau neu dri thwll ond credir bod y cynnydd ym mhoblogaeth y gwylanod ar Ynys Aberteifi wedi atal rhagor o'r adar rhag dychwelyd. Defnyddiwyd peiriant sain hefyd i geisio hudo'r adar drycin Manaw yn ôl i'r ynys; yn wahanol i adar fel y pâl sy'n brysur o gwmpas y nythfan liw dydd ac yn fwy tebygol o gael eu denu gyda dyfais weledol, rhaid troi at dechneg acwstig i geisio twyllo adar drycin Manaw sy'n dod nôl i'r tir liw nos. Ond ni chafodd uchelseinyddion eu gosod ar y ddyfais sain tan 1989 ac felly mae'n bosib na fu'r dechneg hon mor llwyddiannus ag y gallai fod wedi bod yn ystod blynyddoedd allweddol cynnar yr arbrawf. Ffactor arall a ddylanwadodd, efallai, ar yr arbrawf oedd y math o alwadau a ddewiswyd i'w chwarae ar beiriant sain. Mae ymchwil wedi dangos mai'r sain sy'n llwyddo orau i ddenu adar yw'r synau a wneir gan bâr sefydledig o'r un rhywogaeth pan fyddant o dan y ddaear ac nid y galwadau a ddefnyddir gan adar o'r un rhywogaeth pan fyddant allan yn yr awyr agored. Canfuwyd un aderyn drycin Manaw a drosglwyddwyd i Ynys Aberteifi yn 1980 yn farw ar Ynys Sgomer saith mlynedd yn ddiweddarach.

Cynnig arall

Yn 2009 penderfynodd RSPB roi cynnig ar ddefnyddio modelau ffug er mwyn ceisio denu palod nôl i Ynys Dewi. Comisiwynwyd gwneuthurwr modelau, sef Eddie Tycer, i wneud 150 o fodelau cywrain a gosodwyd y rhain yn eu lle ym mis Mai 2009. Roedd palod yn nythu ar yr ynys nôl yn y 1800au ond yma hefyd fe lwyddodd llygod Ffrengig i'w difa wedi iddynt ddod i'r tir yn dilyn nifer o longddrylliadau o gwmpas yr ynys. Yn 1894 y nythodd palod am y tro diwethaf ar ynys Dewi, yn ôl cofnodion.

Ganrif yn ddiweddarach aeth yr RSPB ati i glirio llygod Ffrengig (a chathod erbyn hynny!) o'r ynys. Mae creu y cynefin cywir – sef digon o dyllau addas a dim ysglyfaethwyr

Eddie Tycer

Greg Morgan a Phil Newman, Wardeniaid Ynys Dewi, gosod rhai o'r palod ffug ar lethrau Felin Fawr. / Greg Morgan and Phil Newman, Wardens on Ramsey Island, placing puffin decoys at Felin Fawr.

ar gyfyl y lle, yn hanfodol i lwyddiant unrhyw ymgais i ailsefydlu poblogaethau adar sy'n nythu dan ddaear. Ym Mhrydain mae llawer o'r gwaith sydd wedi digwydd mewn gwahanol fannau i ddenu palod nôl i nythu ac i gynyddu eu niferoedd – ar Ynys Lundy, Ynys Seiriol, Ailsa Craig, Ynys Handa - wedi canolbwyntio ar wared llygod Ffrengig ac mae'r cynnydd mewn niferoedd weithiau wedi bod yn sylweddol, yn enwedig yn yr Alban.

Mae'r rhagolygon ar gyfer dychweliad y pâl i Ynys Dewi yn edrych yn galonogol. Ers 2000, yn dilyn y gwaith i glirio llygod Ffrengig a chathod o'r ynys, mae niferoedd adar drycin Manaw wedi codi a llynedd fe gofnodwyd pedryn drycin yn nythu am y tro cyntaf. Fe fyddai'n braf iawn gallu croesawu'r pâl yn ôl i gwblhau'r triawd o nythwyr tanddaearol.

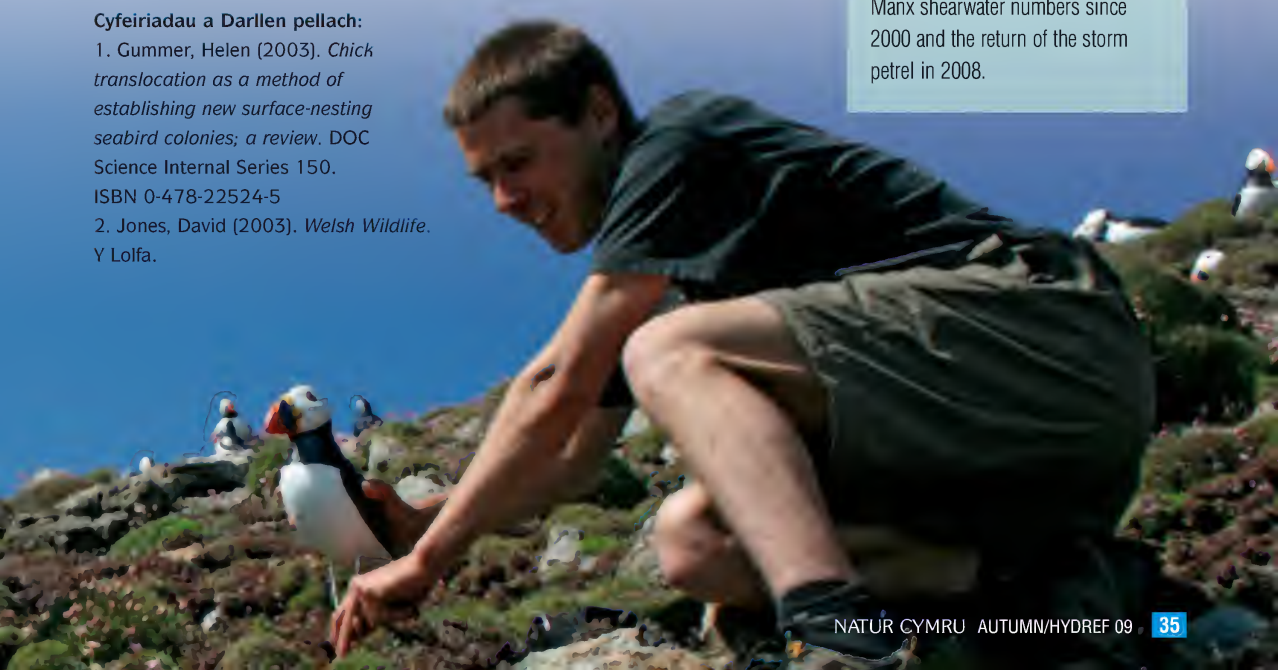
Mae tua 8,000 o barau palod yn nythu gerllaw ar Ynys Sgomer; y nythfa fwyaf yn ne Prydain ac mae poblogaethau hefyd ar Sgogwm a'r Cerrig (y 'Bishops and Clerks'). Y gobaith yw ceisio denu rhai o'r adar ifanc a fagwyd yn y mannau hyn wrth iddyn nhw chwilio am le addas i ddechrau nythu am y tro cyntaf. Os byddan nhw'n glanio ar Ynys Dewi fe welan nhw bod digonedd o dyllau addas yno ar eu cyfer gan fod nifer dda o gwningod yn bresennol ar yr ynys. Gyda phoblogaeth mor gref gerllaw, mae mwy o siawns y bydd ambell aderyn dewrach na'i gilydd yn fodlon mentro i le newydd. Does dim newyddion hyd yn hyn am lwyddiant y prosiect, ac mae'n bosib y bydd angen defnyddio sain i greu mwy o atyniad mewn blynyddoedd i ddod. Cawn weld!

*Mae **Elinor Gwynn** yn gweithio fel Cynorthwydd Gweithredol i Gyngor Cefn Gwlad Cymru.*

Cyfeiriadau a Darllen pellach:
1. Gummer, Helen (2003). *Chick translocation as a method of establishing new surface-nesting seabird colonies; a review*. DOC Science Internal Series 150. ISBN 0-478-22524-5
2. Jones, David (2003). *Welsh Wildlife*. Y Lolfa.

Lure of the Wild

Decoys have been used twice on Welsh islands since the 1980s in an attempt to lure puffins back to breed in their historic nesting sites. The puffin populations on both Ramsey and Cardigan Islands were wiped out in the 19th century as a result of rat invasions from shipwrecks. Decoys are one of a range of techniques used around the world today to encourage the establishment of ground-nesting bird populations; much of the pioneering work was undertaken by the National Audubon Society in the USA during the 1980s. The experiment to attract puffins back to nest on Cardigan Island in the late 1980s was unsuccessful. However, in 2009 the RSPB initiated a similar experiment on Ramsey, following the successful eradication of rats and cats from the island. It's early days, but there's room for cautious optimism given the increase in Manx shearwater numbers since 2000 and the return of the storm petrel in 2008.



Seaweed harvesting in Wales

It is easy to forget how dependent we are on the natural environment. On land we have replaced natural plants and animals with ones we grow exclusively for ourselves. In the oceans the commercial harvesting of natural resources is often rapacious. ***CLARE DAVIES*** *describes the benefits and uses of seaweed, an abundant resource, the gathering of which continues an ancient and truly sustainable tradition.*

CCW

Serrated wrack / *Fucus serratus* / Gwymon danheddog

Rohan Holt

Kelp / *Laminaria digitata* / Morwiail

Seaweed is commercially farmed and foraged for in the wild for its countless applications and medicinal purposes. It has been used by people for many hundreds of years with records of its collection in Japan dating as far back as the fourth century. The brown seaweeds (*Phaeophyceae*) such as kelps and fucoids are the most commonly harvested. In Japan the red seaweed (*Rhodophyceae*) *Porphyra spp.* is cultivated for the thin sheets used in sushi called 'Nori'. Kelp *Laminaria spp.* is harvested for alginates used as food additives (gelling agents E400 and E405), and in the production of paper and textiles. *Chondrus crispus*, commonly referred to as Irish moss or Carrageen, is also used for the extraction of its alginate, agar and gelatinous properties.

The high nutrient content in seaweed makes it possible to use it as an organic fertilizer, and it is also used in animal feed as a vitamin supplement. The plants contain high levels of iodine which assists in the production of the hormone thyroxin, an aid in maintaining an active thyroid, and seaweed can be used as a natural slimming aid. Many luxury cosmetic products now contain seaweeds; thalassotherapy describes the beauty treatments, wraps and scrubs available that use seaweed.

Laver Bread – "The Welshman's Caviar"

Commercial harvesting of seaweed in Wales is restricted to the exposed rocky shores of south and west Wales. It is harvested from the Gower and

Pembrokeshire areas and often reaches as far north as the Barmouth region (Ashley Jones, pers com). The red algae *Porphyra umbilicalis* is collected for the traditional Welsh delicacy purple laver bread, or Bara Lawr in Welsh. Green algae *Ulva lactuca* is less commonly used to produce green laver bread. The laver bread is handpicked by fishermen on the shores and processed predominantly by the same companies that collect and process cockles from the Burry Inlet. There is little or no collection in mid or north Wales other than that for personal use. However, the Countryside Council for Wales has a single consent on an SSSI in Pen Llŷn, north Wales, for the collection of *Fucus spp*. to be used as fertilizer on a small holding. When there is a shortage of seaweed in south Wales it is imported freshly from Port Patrick and Fort William in Scotland, and also from Rosslare in Ireland. A few firms employ a single fisherman to collect the seaweed. The cockle processing plants are used to wash the laver bread, and then it is boiled for several hours until it becomes soft. Laver bread is then minced to a fine black/green paste consistency to be used in many diverse recipes. Traditionally it is eaten spread thinly on toast with oatmeal and vinegar served with bacon. The late Richard Burton once famously referred to it as "The Welshman's caviar."

Jon Moore CALM

Slipper limpets *Crepidula fornicata*, sea lettuce *Ulva lactuca* and clumps of red algae / Ewinedd mochyn *Crepidula fornicata*, letys môr *Ulva lactucaa* chlystyrau o algâu coch

On average 30 tons of wet seaweed are collected per annum for a single processor, the re-sale value of which is approximately £50,000. During 2005 the production of laver bread was worth about £500,000 per year to the Swansea area economy. The demand for laver bread is declining nowadays, with the highest demand in south Wales. Processors are therefore looking at collaborating with IBW (International Business Wales) to broaden distribution internationally, in particular working closely with Japan where the demand is greatest. However, Japan cultivates its own seaweed so has very little interest.

Future developments

The UK government is looking closely into seaweed cultivation for its many versatile uses. The field is recent in terms of research, SAMS (Scottish Association for Marine Science) and C-MAR Group being among the few that have looked at seaweed cultivation in the UK. One of the main drivers behind seaweed cultivation is its potential to clean up aqueous waste from fish farms. The extra nutrients in the water around the cage sites enhance the algal growth, and reduce the levels of toxic substances such as nitrate in the water column. This 'integrated farming' is beneficial for both parties.

The fermentation of seaweed produces bioethanol, used as a biofuel. There is limited research into the use of seaweeds as a biomass crop in the UK: however there have been some suggestions that growth sites could be placed on existing offshore renewable structures (e.g. using the underwater supports of wind turbines as culture sites). Other options would be to grow seaweeds on lines suspended in the water column in offshore farms (i.e. where algae don't normally grow) and harvest these. Seaweed growth is unquestionably very fast – some kelp will increase their biomass by 10% per day. Using seaweed as a biomass would undoubtedly reduce land space concerns that arise with current biomass crops. Ireland, with rich seaweed resources, is tipped to become an integral component in biofuel production.

Currently in Wales there is no cultivation of seaweed taking place, it is only harvested from the wild. However our 1,200km of coastline has the potential to be used for seaweed cultivation.

Cynaeafu Gwymon yng Nghymru

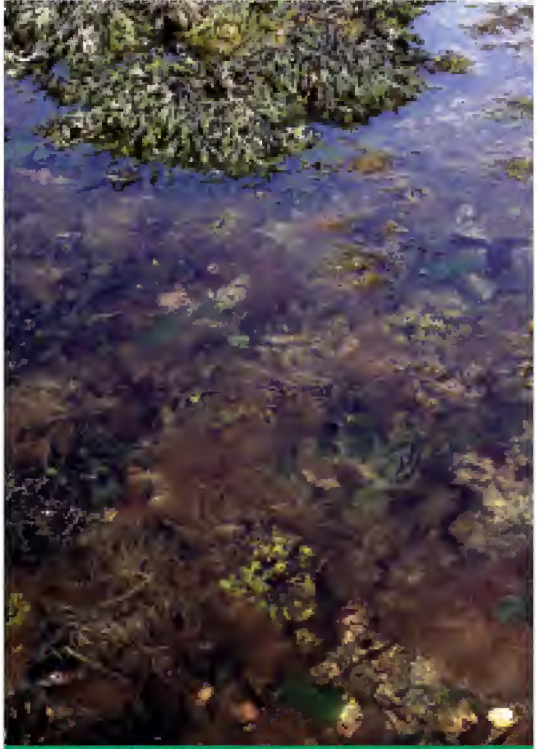
Y defnydd a'r manteision

Mae gwymon yn cael ei 'ffermio'n' fasnachol a'i gasglu yn y gwyllt oherwydd bod modd ei ddefnyddio at sawl pwrpas diwydiannol, meddygol a phersonol. Y gwymonau mwyaf poblogaidd ar gyfer eu tyfu a'u cynaeafu yw'r gwymonau brown, er enghraifft y môr-wiail a'r gwymonau '*Fucus*' fel y gwymon danheddog a'r gwymon codog-mân. Yn Siapan mae'r gwymon lafwr coch *Porphyra spp.* yn gael ei dyfu'n bennaf ar gyfer ei fwyta. Cynaeafir môr-wiail *Laminaria spp.* er mwyn ei ddefnyddio fel alginad sy'n cael ei ychwanegu at fwydydd (E400 a E405), fel deunydd gelio ac fel cynhwysyn mewn prosesau cynhyrchu papur a thecstiliau.

Mae'r lefelau uchel o faetholion mewn gwymonau yn golygu ei bod yn bosib eu defnyddio fel gwrtaith organaidd a'u cynnwys, fel ffynhonnell ychwanegol o fitaminau, mewn porthiant anifeiliaid. Mae gwymon hefyd yn cynnwys lefel uchel o iodin, sy'n helpu cynhyrchu'r hormon Thyrocsin sydd wedyn, yn ei dro, yn helpu sicrhau bod y chwaren thyroid yn gweithio'n iach. Gall gwymon hyd yn oed helpu pobl golli pwysau! Mae nifer fawr o gynnyrch cosmetig moethus bellach yn cynnwys gwymonau.

Bara lawr – 'cafiâr y Cymro'?

Dim ond ar draethau agored a chreigiog De a Gorllewin Cymru y mae gwymon yn cael ei gynaeafu ar raddfa fasnachol. Cesglir y lafwr *Porphyra umbilicalis* i gynhyrchu bara lawr porffor, sy'n fwyd traddodiadol Cymreig. Mae'r gwymon yn cael ei gasglu â llaw o'r glannau gan bysgotwyr ac wedyn yn cael ei brosesu, fel rheol, gan yr un cwmnïau â'r rhai sy'n casglu a phrosesu cocos o Gilfach Porth Tywyn. Ar hyn o bryd mae Cyngor Cefn Gwlad Cymru wedi rhoi caniatâd ar



CCW Natasha Lough

Alga brown ffilmentog a'r gwymon danheddog / Filamentous brown algae and serrated wrack

gyfer casglu gwymon *Fucus* ar un Safle o Ddiddordeb Gwyddonol Arbennig ym Mhen Llŷn fel y gellir ei ddefnyddio fel gwrtaith ar dyddyn lleol. Pan fydd 'na brinder gwymon yn Ne Cymru mae'n cael ei fewnforio'n ffres o Port Patrick a Fort William yn yr Alban a hefyd o Rosslare yn yr Iwerddon. Mae'r ffatrïoedd prosesu cocos yn cael eu defnyddio i olchi'r bara lawr ac wedyn caiff ei ferwi am oriau nes ei fod yn feddal. Bydd y bara lawr wedyn yn cael ei falu'n fân nes ei fod yn bâst slwtshlyd du a gwyrdd. Yn draddodiadol cai'r bara lawr ei fwyta ar dafell o fara ceirch wedi'i thostio, gyda finegr a bacwn. Tybed a oedd y diweddar Richard Burton yn llygad ei le wrth ddisgrifio bara lawr fel "cafiâr y Cymro"? Mae'n werth ei flasu cyn penderfynu!

Yn ystod 2005 roedd cynhyrchu bara lawr yn werth hanner miliwn o bunnoedd y flwyddyn i'r economi yr ardal Abertawe. Erbyn heddiw mae'r galw am fara lawr yn lleihau; yn Ne Cymru y mae'n fwyaf poblogaidd. Mae cynhyrchwyr felly yn ystyried a oes lle i gydweithio'n agosach ag IBW ('International Business Wales') er mwyn ehangu gwerthiant gwymon yn rhyngwladol, yn enwedig yn Siapan lle mae'r galw

mwyaf. Ond mae Siapan eisoes wrthi'n tyfu a chynaeafu gwymon ac felly nid yw'n syndod nad oes llawer o diddordeb o'r cyfeiriad hwnnw ar hyn o bryd.

Datblygiadau

Mae llywodraeth yr DU yn edrych yn ofalus ar y posibiliadau sydd ynghlwm wrth ffermio gwymon, yn enwedig gan fod cymaint o ddefnyddiau gwahanol iddo. Mae'r maes yn un hynod o newydd o ran ymchwil. Un o'r cymhellion pennaf ar gyfer ffermio gwymon yw'r angen i lanhau dyfroedd sy'n cael eu llygru gan wastraff o ffermydd pysgod. Mae'r maetholion ychwanegol sydd yn y dŵr o gwmpas y cawelli yn annog tyfiant y gwymon a hefyd yn lleihau lefelau deunyddiau gwenwynig, fel nitradau, yn y dŵr. Mae'r math yma o 'ffermio integredig', felly, yn fuddiol i'r ffermwyr gwymon a'r ffermwyr pysgod fel ei gilydd.

Mae'n bosib eplesu gwymon i greu bio-ethanol, a defnyddio hwn wedyn i gynhyrchu bio-danwydd. Mae rhai wedi awgrymu y gellid creu safloedd tyfu ar adeiladwaith sydd eisoes wedi ei osod yn y môr er mwyn cynhyrchu ynni adnewyddadwy. Ymhith opsiynau eraill y gellid eu hystyried mae tyfu gwymon ar 'ffermydd' o raffau sy'n hongian yn y dŵr yn bell o'r lan ac yna'u cynaeafu. Yn ddi-os, mae gwymon yn tyfu'n hynod o gyflym – gall môr-wiail gynyddu ei fio-màs cymaint â 10% mewn diwrnod. Byddai defnyddio gwymon fel bio-màs yn sicr yn lleihau'r pryderon sy'n codi ar hyn o bryd ynglŷn â thyfu cnydau bio-màs ar y tir.

Ar hyn o bryd, yng Nghymru, nid oes unrhyw wymon yn cael ei ffermio'n fwriadol fel cnwd pwrpasol. Dim ond casglu o'r gwyllt sy'n digwydd o gwmpas ein glannau. Ond mae'n hawdd gweld y gallai 1,200km o arfordir fod yn adnodd pwysig iawn o ran ffermio gwymon yn y dyfodol.

__Clare Davies__ is a Bangor University student who wrote this article during a five-week placement with CCW's intertidal team.
Myfyrwraig o Brifysgol Bangor yw __Clare Davies__, ac fe ysgrifennodd hi'r erthygl yma yn ystod cyfnod o bump wythnos ar leoliad gwaith gyda thîm rhynglanwol Cyngor Cefn Gwlad Cymru.

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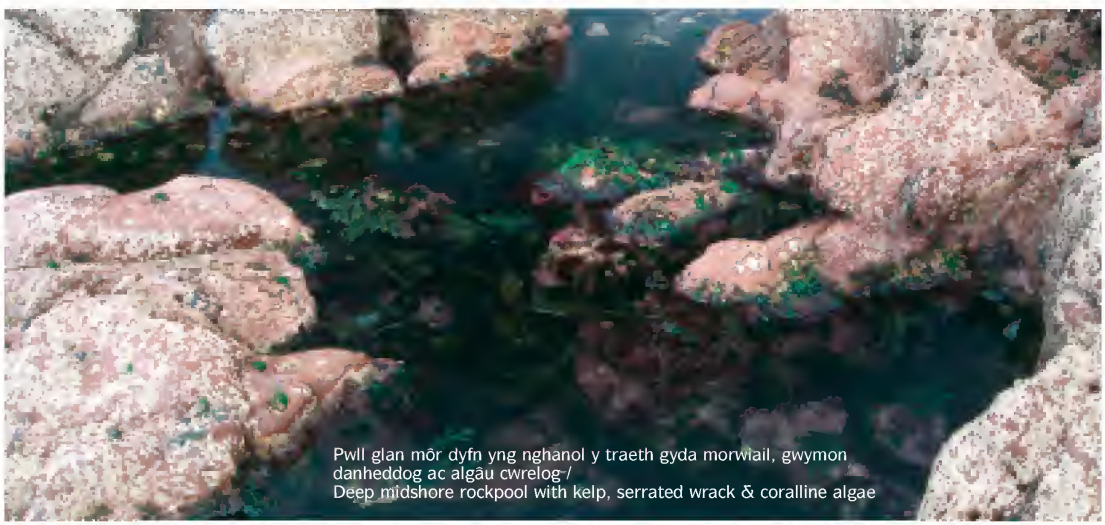

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Pwll glan môr dyfn yng nghanol y traeth gyda morwiail, gwymon danheddog ac algâu cwrelog /
Deep midshore rockpool with kelp, serrated wrack & coralline algae

Darwin in Wales

To mark the 200th anniversary of his birth, 2009 has seen a plethora of Darwin-related television programmes, exhibitions and magazine articles. At *Amgueddfa Cymru* – National Museum Wales, an exhibition to mark the anniversary highlights something less well known about the man – the time Darwin spent in Wales. It might seem surprising that a week with Professor Adam Sedgwick made a significant impact in Darwin's life, but the week was vitally important to his scientific development.

As a boy, Darwin had a keen interest in geology. He collected minerals and even knew how to do chemical analyses of them. At Edinburgh University he had attended geology classes, but found the lectures of the professor, Robert Jameson, dull and boring. As Darwin himself put it: "I determined never as long as I lived to read a book on geology or in any way study the science."

Whilst at Cambridge Darwin spent some time botanising with the Professor of Botany, John Stevens Henslow. Darwin also read the account of Alexander von Humboldt's travels to South America, and this inspired him to plan his own expedition to the Canary Islands, Humboldt's first stop, when he had finished his studies. In anticipation of this, Henslow arranged for the Reverend Adam Sedgwick, Professor of Geology at Cambridge, to take Darwin with him on his fieldtrip to north Wales in the summer of 1831. In preparation Darwin bought the equipment he would need and practised using it beforehand – he had rediscovered his enthusiasm for geology.

Darwin and Sedgwick left Shrewsbury on 5 August 1831 for Llangollen. During the course of the following week, they travelled to Ruthin, Conwy, Bangor and Bethesda. They visited the ruins of Castell Dinas Bran and the limestone cliffs of Mynydd Eglwyseg near Llangollen, and at Cefn Caves near St Asaph they found a fossilised rhinoceros tooth. The fact that little is made of this find might suggest that the two men were not at ease in each others company. How such a fossil came to be in north Wales would have intrigued the young Darwin but challenged the very core of some of Sedgwick's beliefs.

While in north Wales, Darwin often walked long distances on a route parallel to Sedgwick's, noting the geology as he traversed the country. When they met they compared notes on what they had seen. After a week together Darwin and Sedgwick parted company, Sedgwick travelling on to Anglesey and Darwin returning to the mountains of Snowdonia. He spent some time studying the area around Cwm Idwal and wrote to Sedgwick once back in Shrewsbury to clarify various points on what he had recorded after they had gone their separate ways.

On his return to the family home in Shrewsbury Darwin found a letter from Henslow that was to change the course of his life. He had been offered the chance to accompany Captain FitzRoy on his voyage to South America. Although keen to accept the offer his father was very much against and it was only with help from his uncle, Josiah Wedgwood, that his father was persuaded that it would be good for his son to go. Darwin later found out that FitzRoy had nearly also put paid to him going – on account of the size and shape of his nose.

Even though he was only with Sedgwick for a week, the time had a major impact. When Darwin was in South America on the *Beagle* his newly acquired skills allowed him to grasp the geology of a country on a rapid traverse. He wrote to Henslow:

"...tell him [Sedgwick] I have never ceased to be thankful for that short tour in Wales."

In 1842 Darwin made one last visit to Wales, to revisit Cwm Idwal. The visit was spurred by Darwin attending a lecture in London in 1841 by Dr William Buckland on glacial phenomena in north Wales, an area he knew very well from his visit with Sedgewick in 1831. On that occasion both Darwin and Sedgwick failed to see the evidence for glaciation, even though this is one of the best glacial landscapes in Britain. This time, with the new theory fresh in his mind, he immediately saw the signs of glacial erosion and deposition. He made the following observation: "On this tour I had a striking instance of how easy it is to overlook phenomena, however conspicuous, before they have been observed by anyone... a house burnt

©National Museum Wales

Fossilised rhinoceros tooth, actual size

Cwm Idwal

Stewart Campbell

down by fire did not tell its story more plainly than did this valley."

After the trip to Cwm Idwal Darwin spent the rest of his life at Down House in Kent. He dedicated his time to further scientific enquiry, undertaking a prodigious amount of research. Areas of work ranged from cross-fertilisation in plants, the expression of emotions in man and animals, and the habits of earthworms. The latter was to be his last major publication and, when published in 1881, it sold more quickly than *On the Origins of Species*.

***Peter Howlett** is the Vertebrate Curator in the Department of Biodiversity at the National Museum Wales, and curator of the* Darwin: A Revolutionary Scientist *exhibition. **Tom Sharpe** is Curator of Palaeontology in the department of Geology and one of the exhibition authors.*

The exhibition *Darwin: A Revolutionary Scientist* at Amgueddfa Cymru – National Museum Wales runs until January 2010. The following lectures and lunchtime talks are scheduled for the remainder of the year:

Special Evening Lecture:
24 November 6.30pm
Is human evolution over? Steve Jones, UCL
Booking essential: 029 2057 3148.

Lunchtime talks 1.05pm
2 Sept *Darwin's visits to the Caves of Cefn Meriadog in Denbighshire* by Elizabeth Walker
7 Oct *What lies beneath? - cave biology in Wales* by Julian Carter
4 Nov *Parasites and Evolution* by Dr Eric Bowers
2 Dec *Evolution of Whitebeams in the Avon Gorge* by Dr Tim Rich

All events take place at National Museum Cardiff, Cathays Park, Cardiff CF10 3NP and are FREE of charge.

For further information check www3.open.ac.uk/contact/events.aspx
www.open.ac.uk/wales
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NATUR

Sefydliad Rheolaeth Cefn Gwlad a Chadwraeth Cymru

Daeth dwy flynedd o ddatblygu a pharatoi i ben ar Orffennaf 21 yn Sioe Frenhinol Cymru pan lansiwyd NATUR yn ffurfiol fel Sefydliad Rheolaeth Cefn Gwlad a Chadwraeth Cymru. Cytunodd yr Arglwydd Dafydd Elis-Thomas, Llywydd y Cynulliad Cenedlaethol a Llywydd Prifysgol Bangor yn garedig i lansio NATUR.

Mae gwaith diweddar NATUR wedi canolbwyntio ar baratoi ar gyfer lansio aelodaeth. Amcan craidd NATUR yw "ysgogi a datblygu'r sgiliau a ddefnyddiwn i reoli amgylchedd fyw a diwylliannol y tir a'r môr", ac i'r diben hwn mae pecyn wedi ei ddatblygu a fydd yn galluogi aelodau i ddatblygu eu sgiliau, gan gydnabod eu gwybodaeth a'u profiad, a darparu cyfleoedd iddyn nhw ddatblygu cydberthynas weithio ffurfiol ac anffurfiol gydag eraill. Gyda chymorth hael gan Lantra, gall NATUR gynnig system Skills Manager i aelodau, offer ar-lein i'w galluogi i nodi gofynion, cynllunio cynnydd ac adrodd ar gyflawniad.

Mae ceisiadau am Aelodaeth Lawn ac Aelodaeth Gyswllt yn cael eu derbyn yn awr. Mae rhagor o wybodaeth ar gategorïau aelodaeth a ffurflenni cais ar gael i'w trawslwytho oddi ar y wefan ar **www.natur.eu.com**; cliciwch ar y botwm Ymunwch â Ni. Mae'r wefan yn cael ei llunio ar hyn o bryd felly ymwelwch yn rheolaidd gan fod mwy o dudalennau'n cael eu hychwanegu ar hyn o bryd, yn cynnwys manylion am ddigwyddiadau sy'n dod a thrafodion cynadleddau blaenorol. Bydd NATUR yn rhedeg neu'n cyd-gynnal cyfres o weithdai a seminarau yn ystod y flwyddyn nesaf, yn cychwyn gyda Gweithdy Ymwybyddiaeth o Rywogaethau Ymledol gyda Phartneriaeth Bioamrywiaeth Cymru ar Hydref 13; ewch i'r wefan am ragor o fanylion neu cysylltwch â swyddfa NATUR ar y rhif isod.

Welsh Institute of Countryside and Conservation Management

Two years of development and preparation culminated on July 21st at the Royal Welsh Show when NATUR was formally launched as the Welsh Institute of Countryside and Conservation Management. Lord Dafydd Elis-Thomas, Presiding Officer of the National Assembly and President of Bangor University, kindly agreed to launch NATUR.

NATUR's recent work has focused on preparing for the launch of membership. NATUR's core aim is to "stimulate and develop the skills with which we manage the living and cultural environment of land and sea", and to this end a package has been developed that will enable members to develop their skills, recognising their knowledge and experience, and providing opportunities for them to develop formal and informal working relationships with others. With generous assistance from Lantra, NATUR is able to offer members the Skills Manager system, an online tool allowing them to identify requirements, plan progress and report on achievement.

Applications for Full Membership and Affiliate Membership are now being accepted. More information on the membership categories and application forms are available for download from the website at **www.natur.eu.com**; click on the Join Us button. The website is under construction so please visit regularly as more pages are currently being added, including details of upcoming events and proceedings of previous conferences. NATUR will be running or co-hosting a series of workshops and seminars over the next year, commencing with an Invasive Species Awareness Workshop with the Wales Biodiversity Partnership on October 13th; visit the website for more details or contact the NATUR office on the number below.

A plea! We particularly appeal to those who are more established in their careers to apply to join NATUR in this early stage of membership, and to consider becoming mentors to Associate Members. Help those who are just beginning their careers, and help NATUR in its aims of supporting and maintaining a skilled and motivated professional workforce.

Marie Madigan, Swyddfa NATUR Office, PO Box 192, Priory House, Penmon, Beaumaris, Ynys Môn, LL57 9BY
Ffôn / Tel: 07837 419995 • www.natur.eu.com • marie@natur.eu.com

Working with nature – the future of Welsh forests

Climate predictions for future decades pose many new pressures for the nature of Wales. How will our native habitats and wildlife adapt? Foresters across Europe are asking themselves how will our woodlands and forests cope with drier summers, wetter winters, warmer conditions and the increased likelihood of extreme events, such as gales, droughts and floods?

The long lifespan of our trees means we must address the problems of the climate change predictions for the 2080s now, even though it seems a long way off: the trees we plant today will face these changes to the climate in their lifetime.

To help us tackle these problems, Forestry Commission Wales is a partner in *FUTURE*forest, a three-year European project that aims to identify the threats, weaknesses and strengths of Europe's forests as they face up to climate change, and to develop best management techniques to guide policy makers and stakeholders.

There are seven partner regions – Auvergne, Brandenburg, Bulgaria, Catalonia, Latvia, Slovakia and Wales. Each is focusing on a different theme such as biodiversity and soil protection. In Wales we are focusing on the theme of water management. With an increased risk of severe flooding in the future, wooded catchments could be an invaluable tool in managing water balances, reducing peak flows and holding water in the landscape. Wooded floodplains can also help by increasing the length of time floodwater remains in the upper reaches of our rivers, protecting towns at risk from flooding. Such solutions to our water management issues would also provide benefits to aquatic and woodland wildlife.

The *FUTURE*forest partners in the Auvergne also illustrate how forestry can work with nature, where woodlands are managed for biodiversity as well as timber production. It is a sad fact that climate change is already having an impact in the Massif Central, with the native European silver fir *Abies alba* dying through water stress in some of the area's protected forests.

Climate change also brings an increased risk from pests and pathogens, with new species potentially entering Wales which were previously unable to survive here because of our climate. In Brandenburg drought conditions put pine stands under severe stress, and the nun moth *Lymantria monacha* has taken advantage and destroyed large areas of forest. The increased light onto already dry soils had a further impact on the forest through nutrient balance changes, and this resulted in a reduction in ground vegetation.

The forestry sector in Brandenburg has responded by replacing the monoculture forests in trial areas with a more diverse selection of tree species. Increasing species diversity improves the forests' resilience.

In the Auvergne, French foresters have gone one stage further, and begun to look at the viability of creating productive 'irregular' forests. They use a mix of ages as well as species, achieving this by thinning and allowing natural regeneration in their productive forests. Nearly a third of the Welsh Assembly's woodlands are committed to this type of management.

For more than 50 years most forest management in Wales has involved planting monocultures of conifers which are clear-felled to meet production needs after about 40 to 50 years. These forests are highly vulnerable to the impacts of climate change and need to become more diverse.

Forestry Commission Wales, which manages the Welsh Assembly Government woodlands, has already begun increasing diversity by planting more mixtures, reducing the amount of clear-felling, and increasing thinning to create more mixed-age, mixed-species woodlands. As well as ensuring greater resilience in the face of climate change, this will help to create a wider variety of habitats and encourage greater biodiversity.

*FUTURE*forest is funded by the EU and the Welsh Assembly Government. **www.futureforest.eu**

***Dr Helen Cariss** is FUTUREforest Project Manager for Forestry Commission Wales, as well as being a climate change research scientist for Forest Research.*
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helen.cariss@forestry.gsi.gov.uk

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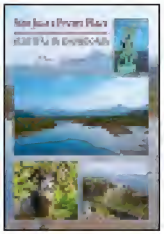
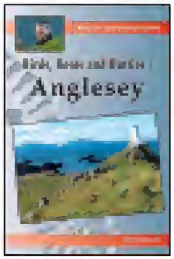


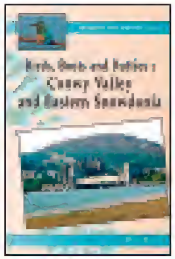
Not Just a Pretty Place – Survival in Snowdonia
Huw Jenkins
Llygad Gwalch
2009 120 pages
Paperback
£7.50

I should begin this review with a disclaimer – Huw Jenkins is this magazine's Marketing Manager, working tirelessly to raise our profile and circulation, so my views are not unbiased. You can always turn to Huw's article on feral goats in this issue and judge for yourself. It is his delight in his new-found 'Cynefin' in Snowdonia, his irrepressible enthusiasm for all around him, which makes this collection of stories so engaging and vivid. Environmental texts are often heavy, and laced with gloom. This little book bounces along, its prose in bite-sized chunks, shafts of humour in every page. It is the ideal companion for visitors to Snowdonia, because it describes real life in the hills, human and non-human, which you won't find in any tourist literature.

There are serious messages here, if you look carefully. What better way to fight the homogenisation of culture and the displacement of nature than to celebrate all the good things that make one's home territory so special? This book should prove a tonic for those who care about the rich mix which makes up the Welsh landscape, a mix of landforms and nature, and of language and culture.

James Robertson





Birds, Boots and Butties
2 books: Anglesey; Conwy Valley/Eastern Snowdonia
Ruth Miller
Llygad Gwalch Cyf 2009,
112 pages each
Paperback £6.50 each

Each pocket-sized book describes ten walks of 1 to 5 miles. The information for each walk is given in a standard format, first the highlights, then directions to the start, including OS map number and grid reference. There follows a brief description of the walk, length, time to allow and type of terrain. I particularly liked the clear separation of the detailed instructions of how to follow the route from interesting things to look out for along the way.

As you would expect, birds feature prominently, with what to look and listen out for as you progress, but some historical information is also included. For each walk there is a summary of what birds can be expected at different times of year, and directions to a café. Other attractions nearby are listed. The book is well-illustrated with colour photographs, but the maps lack a scale and would be clearer if the route was shown in colour.

The appendices include a place-name glossary and Welsh bird names.

These books can be recommended to anyone new to birdwatching in north Wales. They also remind those of us who live here how many birds can be seen on a single walk, and where to get that all-important cuppa – lots of useful information packed into a small book.

Kate Gibbs

Walking Mid Wales' Nature Reserves
Jane Griffiths
Kittiwake 2009
40 pages
Paperback
£4.95

This is the latest in a series of walkers' guides to places such as waterfalls, coastal paths and the Llyn Peninsula. They are clearly laid out, attractively illustrated and generally written by knowledgeable local authors. This booklet contains twenty self-guided walks suitable for all abilities. It provides just the encouragement you need to get those walking boots on and enjoy some glorious nature reserves. At the same time it should recruit a few new members for the organisations which labour to keep their reserves accessible and beautiful, such as, in this case, Radnorshire Wildlife Trust.

James Robertson

Early Spring: An Ecologist and her Children Wake to a Warming World
Amy Seidl
Beacon Press, Boston, Mass.
2009, 192 pages Hardback £16.78

When Amy Seidl's book was first published, it invited instant comparison with one of the defining works of the environmental movement: Rachel Carson's *Silent Spring*. This doesn't quite hold up. Carson was writing for a public oblivious to the impact of agrochemicals. Today, only the wilfully ignorant reject the reality of climate change. Nonetheless, *Early Spring* is the beginning of a new genre – a personal testimony of a world changing around us.

Seidl lives in Vermont, a state about the same size as Wales, tucked away in the northeast USA up against the border with Quebec. It is a landscape of lakes, meadows and, to British eyes, seemingly unending forests. Her lifestyle sounds much like a Welsh smallholder: idyllic and very back-to-nature, if rather unrealistic to most of us.

Early Spring starts with a chapter on weather, before moving on to gardens, forests, rivers and meadows, as well as chapters devoted birds and butterflies. Seidl writes beautifully, with an easy style that can slip effortlessly from monarch butterflies to Milankovitch Cycles and back again. Only occasionally does this approach tip over into something rather too sickly and self-indulgent, perhaps particularly for a British audience.

Each chapter feels like a fireside conversation, with anecdotes about changing nature alternating with homely observations of community life, farming and, in sometimes excessive detail, her children. Lilacs in the US are now blooming over a fortnight earlier than they did forty years ago. Thanks to warmer winters, the maples that provide syrup could be gone from Vermont within a couple of generations. Winter fishing on frozen lakes can no longer be guaranteed. The state capital, Montpelier, had its 'Boscastle moment', when flood water held up by a dam of ice threatened to engulf the town. There are historical details too. The forests of Vermont can seem permanent but, as Seidl explains, the original woodland was stripped by arriving European settlers, so that the state 150 years ago was almost denuded of trees. The forest only returned as the West was opened up, and the farmers moved on.

A number of her observations will strike a chord with Welsh naturalists. Short distance migrants, such as the American robin, seem to be doing well, whilst many species of those dazzling American warblers are declining. The robins time their migration flexibly, using weather conditions, allowing them to adapt to warmer springs. The warblers, by contrast, wintering deep in the jungles of Central and South America, use hardwired cues such as day length, and are unable to adjust the time of their arrival as seasons change further north. The bobolink, a grassland species, is suffering much as our yellowhammers and corn buntings are, because of intensification of grassland management. The lifecycle of checkerspot butterflies (in the same genus as the marsh fritillary) is slowly becoming detached from their favourite foodplants.

This book left me wondering whether anyone could write a Welsh equivalent. Very possibly, but it is the yearly cycle in Vermont that puts climate change into such sharp relief: the crunchingly cold winters melting into colourful spring, the long hot summers and the annual riot of colour that is the New England fall. Indeed, Seidl writes of her fear for the future – a Vermont that has become 'deseasoned', with a wet autumn merging through a mild winter into spring. Very much like our own Welsh weather, in fact.

Early Spring is not for everyone. It comes to few firm conclusions. It often takes a rather vague 'it makes you think, doesn't it?' approach. So if you like strictly factual, extensively referenced scientific work, it cannot be recommended. But if you enjoy evocative writing about nature, and especially if have ever visited New England or neighbouring Canada, Early Spring is a jewel well worth seeking out.

Andrew Lucas

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Say Goodbye to the Cuckoo
Michael McCarthy
John Murray, 2009 Hardback
£16.99
246 pages

This is, quite simply, one of the most enjoyable books about birds I can remember. McCarthy's subject is our migratory birds, and especially the most familiar ones. There are a couple of introductory chapters about the sheer wonder of migration – imagine all 16 million birds arriving in daylight in one day – before he gets stuck into the meat of the book: a series of chapters on the birds themselves, including the nightingale, warblers, turtle dove, swallow, spotted flycatcher, swift and, of course, the cuckoo.

The chapters follow a regular pattern. First, McCarthy looks into the ecology of the species and its associations with humans. There's the nightingale that sang in Berkley Square, the turtle dove in the Song of Solomon, the swallow in Greek literature, and the cuckoo in the first recorded song in English. He then enlists the help of an expert in the species and goes looking for it himself. The author has done a huge amount of research, but plays the role of the enthusiastic amateur, eager to learn from various specialists he meets along the way.

All the chapters are fascinating, but I will pick out two. McCarthy makes his only foray out of southern England, to mid Wales, in search of the wood warbler. Initial maps in a recent BTO atlas newsletter suggest that this, rather than the red kite, is the new 'Welsh national bird', having disappeared from much of its English and Scottish range. McCarthy describes the song of the wood warbler, a descending accelerating trill delivered with shaking wings, as the very 'Spirit of the Place', the essence of Welsh woods in spring.

My other favourite chapter was on the spotted flycatcher. It might seem hard to wax lyrical about a uniformly brown bird whose song consists of just a single, repeated note. Yet McCarthy encounters a study group in the Cotswolds for which this understated species has become an obsession. Personally, I will be unable to see another spotted flycatcher without thinking about Sir Geoffrey Howe – you'll have to read the book for yourself to find out why.

If the chapters amble gently along from one species to another, the final two, on the disappearance of our migrant species, bring the reader up short. The decline is truly astonishing. Cuckoo down by 59% since 1967. Spotted flycatcher down by 84%. Turtle dove down by 82%. Since 1997, two-thirds of wood warblers have disappeared. Many readers of Natur Cymru will have seen these figures before, but I can scarcely remember a more passionate statement about the desperate plight of some of our best-loved birds. We really are saying goodbye to the cuckoo, and many other species besides.

Open the book at any page and you'll soon be drawn in by the author's infectious enthusiasm for his subject. But whatever you do, make sure you read it.

Andrew Lucas

A Field Guide to the Marine Fishes of Wales and Adjacent Waters
Paul Kay and Frances Dipper
Marine Wildlife 2009,
256 pages, Paperback £19.95

As the introduction to this splendid volume states, there is still an awful lot to learn about Welsh marine fish. You won't find a better guide to what we already know, not just because it is more comprehensive that other books on the subject, but because of the way this information is put over. The underwater photography is superb, and it is complemented with line drawings, maps and other visual aids to help the guide fulfil its practical task. For this is a book with a mission, designed to encourage us all to take an interest in fish. Those of us in direct contact with marine creatures, whether as rock-poolers and beachcombers, as divers and snorkelers, or as fishermen, can now use this guide to help us identify properly the fishes we encounter. This way, some of the gaps in our knowledge should be filled. Congratulations are due to all those who have helped bring this valuable and attractive book into being. The task now is to get it into as many hands as possible!

James Robertson

Marine matters

The bi-centenary of Darwin's birth and particularly the 150th anniversary of the publication of *On the Origin of Species* were celebrated this year, but some of his other significant achievements have had less attention. For example, during the years 1846 to 1854, while the manuscript of the *Origin* lay in a parcel under the stairs at Down House, the great man busied himself studying the morphology and relationships between types of barnacle. In 1851 and 1854 the two volumes of his monograph on the sub-class Cirripedia were published. Looking at the illustrations in it today one marvels at the detail he observed from preserved material using relatively primitive microscopes. In our own time the development of underwater digital photography epitomised by images in Paul Kay and Frances Dipper's book on Welsh Marine Fish (reviewed in this issue) allows features of marine organisms to be captured in life that are sometimes more diagnostic than in preserved specimens.

As a child, Darwin went on holiday to Towyn on the Merioneth coast where he must have encountered barnacles, but his scientific interest in the group can be traced to a conch shell picked up on a Chilean beach during the *Beagle* voyage at Christmas 1834. In holes bored in this shell he was intrigued to find an unusual crustacean that turned out to be an aberrant type of barnacle. A related barnacle, *Trypetesa* (*Alcippe*) *lampas*, can also be found off the Welsh coast. Unlike more familiar acorn barnacles of rocky shores, it lives as a commensal in tiny slits bored in the columella of large whelk shells inhabited by hermit crabs *Pagurus bernhardus*. Another unusual feature which Darwin later observed in *Trypetesa* was that much reduced males were attached to the females instead of having a separate existence. Relationships between the various families and genera of barnacles played a testing, if underplayed role, in refinement of the natural selection theory.

Because *Trypetesa* occurs rather sparsely off Wales and is not obvious to the casual observer, the true distribution and frequency of its occurrence is less well known than the historical significance might justify. Much better known today, but intriguing none the less, is the distribution around Wales of a relatively large intertidal barnacle of the usual conical form, *Balanus perforatus*. It has well established populations on rocky shores in Pembrokeshire but does not spread much north of the St David's peninsula. In spite of having a planktonic larval stage lasting several weeks it has not even crossed St George's Channel to colonise Ireland. Nevertheless from time to time large numbers have been found growing on plastic fish boxes washed further up St George's Channel to north Wales. When this happened in winter 2003/04 there was evidence suggesting that recruitment onto the plastic flotsam might have taken place near the Gallician coast of NW Spain. It is one of the species whose distribution is expected to respond to climate change.

While some barnacles normally settle on rock, others select biological surfaces such as the shells of other animals. Some plastics resemble organic surfaces so that another barnacle *Solidobalanus fallax*, which in Darwin's time would have lived mainly on the shells of queen scallops, has found a new habitat as a fouling organism on the polypropylene netting of modern lobster pots and has also been found on sunken plastic bags.

Much of the scientific effort on barnacles since Darwin's time was ultimately to understand and deter settlement on ship's hulls but with spin-offs in understanding the basic biology, natural history and biogeography. In turn these small organisms played a part in major historical events during Darwin's lifetime. For example, the success of the British Navy during the Napoleonic wars was in part due to the sheathing of the ships with copper, hence the expression 'copper-bottomed' to denote reliability. The copper reduced fouling by barnacles and other marine organisms. This gave them an edge in speed, manoeuvrability and endurance between refits. Moreover, much of the copper came from Parys Mountain in Anglesey and was smelted in Swansea, linking together places in Wales and barnacles in 19th century history.

Ivor Rees

Hysbysfwrdd / Noticeboard

If you would like your wildlife event to feature on these pages please contact us on 01248 387373 or email info@naturcymru.org.uk (entries may be edited). Please mention Natur Cymru if you attend any of these events.

National Museum Wales

DARWIN: A REVOLUTIONARY SCIENTIST

For details of Autumn events see page 41

In association with the Guardian, Academi & the National Library of Wales

Condry Festival of Writing & Nature
Nature & Outdoor Writing At Its Finest
With John Vidal, Ian Gregson, Gwyn Thomas, Gillian Clarke, Damian Walford Davies, Paul Evans, Jim Perrin, John Beatty, Andrew Green and Cameron MacNeish.
17 October, Tabernacl, Machynlleth
Tickets: day session (10.00-6.00)£11; evening 7.30-9.00 £6; day and evening £15. Available from the National Library of Wales or the Tabernacl. Further details:
Sian Northey 01766 522 765, sian_northey@yahoo.com

Fenn's, Whixhall & Bettisfield Mosses NNR

EVENTS
Full details: **Caroline Dahn 0300 060 0583 or email caroline.dahn@naturalengland.org.uk**
11 Oct *Fungal Foray*. Afternoon walk to discover the fabulous fungi on the Mosses with Roy Mantle of the Shropshire Fungus Group. Booking essential
11 Nov *Why restore the Mosses?* Illustrated talk: Joan Daniels looks at how the restoration can help not only wildlife but you too!
VOLUNTEERS
Meet for practical work on 2nd Sunday and 4th Thurs of each month. **Joan Daniels 01948 880362, joan.daniels@naturalengland.org.uk**

North Wales Wildlife Trust

ANNUAL LACEY LECTURE
The Past and Future of Fish and Fishing
Prof Callum Roberts, author of *Unnatural History of the Sea*
23 Oct Main Arts Lecture Theatre, University of Bangor
Further details **01248 351541 nwwt@wildlifetrustswales.org**

Plas Tan y Bwlch

Canolfan Astudiaethau a Gwasanaethau Addysg/Environmental Studies and Education Centre, Snowdonia
PROFESSIONAL TRAINING COURSES
Discounts for those working in Wales
6-9 Oct *Invasive Plants – History, Identification & Control*
19-21 Oct *A Duty For Biodiversity – Delivering Benefits For All*
Aims to increase awareness of the fundamental importance of biodiversity to the economy, to health and to society, and of the supporting legislation. To discuss course content please contact Julia Korn **j.korn@ccw.gov.uk**
9-13 Nov *Foundation Course for Wardens & Rangers*
16-20 Nov *Management Planning in the Countryside*
30 Nov – 4 Dec *Access & Public Rights of Way, Law & Management*
1-2 Dec *Project Management*
To book: **01766 772600, plas@eryri-npa.gov.uk, www.plastanybwlch.com**

WWT

National Wetland Centre Llanelli, Carmarthenshire SA14 9SH, 01554 741087
info.llanelli@wwt.org.uk
www.wwt.org.uk
October Date TBC *Fungi Foray*. Have you ever wondered what sort of mushrooms are growing in your backyard or around these parts of Wales? Join us for a guided walk with an expert, exploring the world of fungi, seen and unseen. 2pm, booking essential.
10 or 11 Oct *Tim Collier Intermediate Photography Course*10am-4pm. £38 inc. refreshments. Booking essential.
24 Oct-1 Nov *Autumn Holiday Fun & The Big Draw.* Discover the joys of drawing - we provide the pencils, the paper and the inspiration. All welcome.
31 Oct *Halloween Party* Dress up in your best (or worst) outfit. Bring a torch for the Spooky Walk through the Millennium Wetlands. For 4-11 year olds. 6-8.30pm, £10 per child, including a spooky goodie bag (accompanying adults free). Booking essential.
7 or 8 Nov *Tim Collier Advanced Photography Course.* 10-4pm. £38 inc. refreshments. Booking essential.
14 Nov *Janet Bligh Painting Day*. Mixed media 10am-4pm. £25 – Admission, refreshments, tuition included. Booking essential.
5 & 6 Dec *Christmas Craft Fair*. First chance to visit Santa and help him feed the birds.
12 Dec *Children's Christmas Party*. Tea party, a gift from Santa, party games, and make a present to take home. 12-2pm. Booking essential.
13 & 20 Dec *Santa on a Sunday* Help Santa feed the birds at 1.45pm and then visit him in his grotto.

NEW Wildlife

EVENTS
17 Oct *Fungi Foray*. Identify fungi at Rhydymwyn.
30 Oct *Halloween Horrors*. Party at Rhydymwyn.
31 Oct *Halloween trail*. A spooky walk through the woods; bring good walking shoes. Llwyni Reserve, Connah's Quay.
28 Nov *Christmas Craft Creation* Make decorations & cards in time for the festive season; Rhydymwyn.
5 Dec *Habitat Management Day* Bring your wellies or boots to Ffrwd Quarry, Cymau.
11 Dec *Santa Trail*: Follow the elves through the woods to find Santa. Llwyni Reserve, Connah's Quay.
12 Dec *Christmas treasure hunt* Follow the clues and answer the riddles as we search for Santa's Grotto; Rhydymwyn.
All events are FREE but check to see if you need to book. Full details: Cat Lucas **cweo@newwildlife.org.uk**
www.newwildlife.org.uk
Rhydymwyn Valley Nature Reserve, near Mold, Flintshire, CH7 5HQ
Tel: 01352 742238/ 742115

Diolch am y lluniau i / For illustrations, thanks to:
Valerie Land, Mandy Marsh, Natural England, Alastair Robertson.

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Number Rhif 31

Grey seals and kelp

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CCW/Paul Brazier

Cardigan Island/Ynys Aberteifi

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